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# United States Testing Company, Inc.

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TASK 14

TEMPERATURE-HUMIDITY TESTS
SIGNAL CORPS ENGINEERING LABORATORIES
CONTRACT NO. DA-36-039 SC-63088
FILE NO. 218-PH-54-91 (3430)
JULY 1, 1954 - JUNE 30, 1957

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Approved by L. J. Perenic

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TABLE OF CONTENTS

1. FOREWORD:

In order to achieve standardization of electronic components among various countries it is necessary to perform tests from which specifications can ultimately be written. As there is considerable disparity between countries with regard to climate, laboratories, methods, and standards it was necessary to perform tests on similar components in various laboratories to determine to what degree correlation could be attained.

2. PURPOSE:

The purpose of this report is to present the results of three different humidity cycles on capacitors and resistors made by various manufacturers in several countries. The ~~tests, measuring~~ techniques, and instrumentation are described ~~in detail~~.

3. SUMMARY:

This report presents information on components subjected to 10 days of humidity cycling in accordance with Method 106 of Specification MIL-STD-202, modified; 84 days of humidity cycling in accordance with test C, Clause 4.3. of IEC publication No. 68; and 84 days of humidity cycling of a modified IEC test. The detailed description of the tests, techniques, and instrumentation, together with the test results data will permit comparison with the findings of other laboratories.

DISCUSSION

B. Equipment Used (cont'd).

| Equipment | Manufacturer | Model | Serial No. |
|---|---|---|---|
| Precision Capacitor | General Radio Co. | 722-D | 4663 |
| Standard Signal Generator | General Radio Co. | 1001-A | 1883 |
| Oscillator | General Radio Co. | 1302-A | 531 |
| Amplifier and Null Detector | General Radio Co. | 1231-B | 1209 |
| Tuned Circuit | General Radio Co. | 1231-P2 | 1633 |
| Megohm Bridge | General Radio Co. | 544-B | 1437 |
| Oscilloscope | Dumont | 274-A | 410 |
| Receiver | Hallicrafter | SX-28 | HA11077 |
| Power Supply, Regulated, DC | Oregon | D6 | 1085 |
| VTVM-VOM | Triplett | 631 | - |
| Humidicator | Weston | 8704 | - |
| Wheatstone Bridge | Leeds & Northrup | 4725 | 1048361 |
| Galvanometer | Brown Instrument Co. | 104 WIG | 1055 |
| Humidity Chamber | American Instrument Company, Inc. | 4-3475 | K-9982A |
| Humidity Chamber | American Instrument Company, Inc. | 4-3475 | K-9982B |
| Standard Recovery Condition Cabinet | United States Testing Co. | -- | -- |

4. DISCUSSION:

A. Types of Components.

The following are the types of components that were tested and the country of the suppliers:

| | Type of Component | Country of Supply |
|---|---|---|
| I | Sealed | |
| | a) Paper capacitors (metal with glass) | USA |
| | b) Paper capacitors (metal with neoprene) | UK |
| II | Partially sealed | |
| | Paper capacitors (phenolic moulding) | USA |
| III | Coated | |
| | a) Ceramic capacitors (painted) | Netherlands |
| | b) Ceramic capacitors (phenolic coating) | UK |
| | c) Paper capacitors (wax dipped) | UK |
| | d) Resistors (cracked carbon, lacquer coating) | France |

The rated values of these components are:

Paper capacitors:
Ia - .047 uF, 400 volts.
Ib - .05 uF, 500 volts.
II - .0068 uF, 500 volts.
IIIc - .05 uF, 500 volts.

Ceramic capacitors (IIIa and IIIb):
100 pF, 500 volts.

Resistors (IIId):
470,000 ohms, 1/2 watt.

B. Equipment Used.

The following equipment and instruments were used for the tests:

| Equipment | Manufacturer | Model | Serial No. |
|---|---|---|---|
| Capacitance Bridge | General Radio Co. | 716-CS1 | 1754 |
| Capacitance Bridge | General Radio Co. | 716-C | 1604 |

DISCUSSION

B. Equipment Used (cont'd).

| Equipment | Manufacturer | Model | Serial No. |
|---|---|---|---|
| Precision Capacitor | General Radio Co. | 722-D | 4663 |
| Standard Signal Generator | General Radio Co. | 1001-A | 1883 |
| Oscillator | General Radio Co. | 1302-A | 531 |
| Amplifier and Null Detector | General Radio Co. | 1231-B | 1209 |
| Tuned Circuit | General Radio Co. | 1231-P2 | 1633 |
| Megohm Bridge | General Radio Co. | 544-B | 1437 |
| Oscilloscope | Dumont | 274-A | 410 |
| Receiver | Hallicrafter | SX-28 | HA11077 |
| Power Supply, Regulated, DC | Oregon | D6 | 1085 |
| VTVM-VOM | Triplett | 631 | - |
| Humidicator | Weston | 8704 | - |
| Wheatstone Bridge | Leeds & Northrup | 4725 | 1048361 |
| Galvanometer | Brown Instrument Co. | 104 WIG | 1055 |
| Humidity Chamber | American Instrument Company, Inc. | 4-3475 | K-9982A |
| Humidity Chamber | American Instrument Company, Inc. | 4-3475 | K-9982B |
| Standard Recovery Condition Cabinet | United States Testing Co. | -- | -- |

DISCUSSION

C. Test Conditions.

1. Test series A. In accordance with test C, clause 4.3 of IEC publication No. 68.

a. In the chamber for this test it was possible to vary the temperature in any region where the components were placed, especially between 35°C. ± 2°C. and 25°C. ± 2°C.

b. The upper temperature was maintained for 12 hours and the lower temperature for not less than 5 hours, the complete cycle taking 24 hours.

c. The relative humidity during the period of maintained elevated temperature was between 95 and 100 per cent.

d. Figure 1 in the appendix is a chart on which was recorded the conditions within the chamber for a representative 24-hour period.

e. The components were subjected to this test for 84 days.

2. Test series C. Modified IEC test.

a. In the chamber for this test it was possible to vary the temperature in any region where the components were placed, especially between 40°C ± 2°C. and 30°C. ± 2°C.

b. The upper temperature was maintained for 12 hours and the lower temperature for not less than 5 hours, the complete cycle taking 24 hours.

c. The relative humidity during the period of maintained elevated temperature was between 95 and 100 per cent.

d. Figure 2 in the appendix is a chart on which was recorded the conditions within the chamber for a representative 24-hour period.

e. The components were subjected to this test for 84 days.

DISCUSSION

C. Test Conditions (cont'd)

3. Test series J. In accordance with Method 106 of MIL-STD-202, modified — in what way?

a. In the chamber for this test it was possible to vary the temperature in any region where the components were placed, especially between 65°C ± 2°C and 25°C ± 2°C.

b. The daily humidity cycle consisted of the following steps: — what cycle is this?

How does the work? The 10 day cycle has 7 steps.

Step 1. 4-1/2 hours at 65°C.±2°C. and a relative humidity of 90 to 95 per cent.

Step 2. 2 hours cooling to 25°C.±5°C. and a relative humidity of 90 to 95 per cent.

Step 3. 2-1/2 hours at 25°C±5°C. and a relative humidity of 90 to 95 per cent.

Step 4. 4-1/2 hours at 65°C.±2°C. and a relative humidity of 90 to 95 per cent. The temperature was raised to this value as rapidly as possible.

Step 5. 2 hours cooling to 25°C.±5°C. and a relative humidity of 90 to 95 per cent.

Step 6. 8-1/2 hours at 25°C.±5°C. and a relative humidity of 90 to 95 per cent.

c. Figure 3 in the appendix is a chart on which was recorded the conditions within the chamber for a representative 24-hour period. This does not support the above

d. The components were subjected to this test for 10 days.

D. Number of Components Tested.

The following are the number of each type component tested:

DISCUSSION

D. Number of Components Tested (cont'd).

| Test Series | Component | | | | | | |
|---|---|---|---|---|---|---|---|
| | Ia | Ib | II | IIIa | IIIb | IIIc | IIId |
| A | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| C | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| J | 10 | 10 | 10 | 10 | 10 | 10 | 9 |

E. Identification.

1. Sample identification.

Each component was provided with a numbered tag which remained legible during the whole test. For test series A the components were serially numbered from 31 through 45, for test series C from 46 through 60, and for test series J from 61 through 70. The physical appearance of each type component is illustrated in Fig. 4 of the appendix.

2. Data sheet identification.

The results of tests of each component type are contained on two data sheets (only one sheet for IIId). An example of the sheet designation is given below:

Sheet No. Ia/A/1, means:

Type of component: Ia = Paper capacitor, metal with glass seal.

Test series: A = In accordance with Test C, Clause 4.3. of IEC publication No. 68.

Serial number: First sheet giving capacitance (column A) and tangent of loss angle (column B).

NOTE: In order to facilitate the comparison of all results the sheets on which capacitance plus tangent of loss angle (or resistance) are given were numbered 1 and the sheets for insulation resistance were numbered 2.

DISCUSSION

F. Measuring Methods.

1. The capacitance value and the tangent of loss angle of paper capacitors were measured at 1000 cycles per second. Special clips were used for attaching the capacitors to the measuring terminals of the bridge. The same polarity was always used.

2. The capacitance value and the tangent of loss angle of ceramic capacitors were measured at 990 kilocycles per second. The length and position of the leads were kept the same during all the measurements so as not to influence the results of the measurements. Special clips were used for attaching the capacitors to the measuring terminals of the bridge. All interconnecting leads were maintained as close to the original position as possible.

3. The insulation resistance between terminals was measured with full rated voltage. The voltage was applied at once through the internal resistance of the test apparatus. The capacitor was charged for 20 seconds and the test instrument was balanced at the end of an additional 10 seconds. To determine the insulation resistance between the terminals and the case the same procedure was followed, except that the charging time was only 10 seconds and the balancing time 5 seconds. When measuring the insulation resistance between terminals (T-T) of capacitors encased in metal a guard circuit was used. A schematic of the circuit, the special jig, and explanation are given in Fig. 5 of the appendix.

4. The resistance values of the resistors were measured with a DC voltage of 90 volts. The time of voltage application was kept to five seconds or less. During the few instances when the five second time limit was exceeded the resistor was allowed to cool off before the voltage was reapplied for making the measurement.

5. The same instruments were used for making the measurements during the entire test period. This obviated the possibility of slight differences between instruments from influencing the measurements. The instruments were calibrated periodiodically during the test period to assure accuracy of measurements.

F. Measuring Methods (cont'd).

6. Whenever the relative humidity in the laboratory exceeded 75 per cent, measurements were made in an air conditioned room. In some instances certain measuring equipment was already located in air conditioned rooms. In such instances all measurements were performed in these rooms, regardless of the relative humidity in the laboratory.

7. The temperature and relative humidity at each measurement time are given on the data sheets.

G. Measurements Before, During, and After the Temperature Humidity cycle.

1. Intervals of measurements.

a. The components were inserted and removed from the temperature and humidity chamber and measured at the intervals specified in Figures 6 and 7 in the appendix.

b. For test series A and C the components were removed from the chamber 7 to 8 hours after the heat was switched off. After removal from the chamber the components were then exposed for one hour to the atmospheric conditions for recovery.

c. The atmospheric conditions for recovery were maintained as follows:

Temperature: 20°C. ± 2°C.
Relative humidity: 75 per cent ± 2 per cent

These conditions were achieved by constructing a cubical box with sides 600 millimeters long. The floor of the box was covered with a stainless steel tray containing sodium chloride (not common salt), which was occasionally sprinkled with water. The surface of the sodium chloride was kept moist, and care was taken that it was not flooded with water. The components to be conditioned were placed on a shelf half-way up the box. Air was circulated by means of a small fan over the tray, up through holes cut at two corners of the shelf, over the samples and down through holes at the opposite corners of the shelf. The motor of the fan was placed on the outside of the box to prevent heat from raising the temperature within the box. The relative humidity

G. Measurements Before, During and After the Temperature and Humidity cycle (cont'd).

was measured by wet-and-dry bulb thermometers. The box was kept in an area in which the ambient temperature was maintained at approximately 20°C. Figures 8 and 9 in the appendix are interior and exterior views of the box.

2. Parameters measured.

a. Initial measurements were made on each type of component prior to the start of the test.

b. The measurements consisted of measuring capacitance, tangent of loss angle, and terminal-to-terminal (T-T) insulation resistance. Capacitors encased in metal were also measured for insulation resistance from terminals-to-case (T-C). Resistors were measured for resistance only.

c. The measurements made at each scheduled removal from the chamber were the same as in b, above.

d. The final measurements for each type of component were the same as in b, above.

e. The only exception to c, above, was in test series J. Each component in this test series was measured after three 24-hour cycles. The components were removed from the chamber and measured as rapidly as possible to determine the value of insulation resistance with conditions as close as possible to those in the chamber. Droplets of water were not shaken off nor were the samples placed in the chamber in which atmospheric conditions for recovery were maintained as described in paragraph G-1-c.

H. Identification of Temperature-Humidity Chambers.

1. As test series A and J were started simultaneously, and test series A was still in progress when test series C was started (at the conclusion of test series J) it was not feasible to perform all tests in the same temperature-humidity chamber.

2. The temperature-humidity chambers used for the tests were made by the American Instrument Company, Inc., Model 4-3475,

H. Identification of Temperature-Humidity Chambers (cont'd).

with Taylor No. 145RR program controllers. These chambers have a temperature range of 4.44°C. to 71°C. and a humidity range of 10 to over 95 per cent. The dimensions of the working space within the test chambers are 1117 mm. by 990 mm. by 482 mm.

3. Figures 1, 2, and 3 in the appendix are charts on which were recorded the atmospheric conditions within the chambers for a representative 24-hour period during test series A, C, and J.

4. Test series A components were in temperature-humidity chamber Serial No. K9982A, while test series C and J were in temperature-humidity chamber Serial No. K-9982B (not simultaneously).

5. The chambers were last calibrated on February 16, 1956. The interval between calibration is nominally six months.

I. Format for Presentation of Measurement Results.

1. All results were entered on data sheets as described in paragraph E-2.

2. All initial measurement values were given in actual measured values.

3. All subsequent measurement results, including final measurements, were given as described below.

a. For components bearing code Ia and Ib the per cent change of the capacitance and tangent of loss angle from the initial values were given. The insulation resistance was given in actual values.

b. For components bearing code II and IIIc per cent change of the capacitance, tangent of loss angle, and insulation resistance (T-T) from the initial values were given.

DISCUSSION

I. Format for Presentation of Measurement Results (cont'd).

c. For components bearing code IIIa and IIIb the per cent change of the capacitance and insulation resistance (T-T) from the initial values were given. The tangent of the loss angle was given in actual values.

d. For components bearing code IIId the change in resistance was given as the per cent change from the initial values.

J. Removal from Test.

1. Components bearing code Ia, Ib, II, and IIIc were removed from test when the insulation resistance (T-T) dropped below 10 megohms.

2. Components bearing code IIIa and IIIb were removed from test when the insulation resistance (T-T) dropped below 100 megohms.

3. Components bearing code IIId were removed from test when the component became open-circuited.

K. Details of changes in schedule and other occurrences.

1. All test series started and finished on schedule.

2. Components bearing code Ib/A and scheduled for measurements on May 30, 1956 and July 4, 1956 (in addition to other dates) were instead measured on May 29, 1956 and July 5, 1956. May 30th and July 4th were legal holidays.

3. Components bearing code Ib/J were measured after the fifth 24-hour cycle, instead of after the third 24-hour cycle. The third cycle occurred on a Saturday.

4. Components bearing code II/J were measured after the fourth 24-hour cycle, instead of after the third 24-hour cycle. The third cycle occurred on a Sunday. Component II/J/68 had traces of oil on the body and was probably the result of a leak in the seal. This was found during measurements after the fourth cycle. It seemed to have no effect on the component surviving test series J.

DISCUSSION

K. Details of Changes in Schedule and Other Occurrences (cont'd).

5. Throughout the entire test period the insulation resistance (T-T) of components bearing code Ia/A were erratic. The indicating galvanometer fluctuated rapidly and many times the insulation resistance apparently was beyond the infinity mark of the test instrument. The fault was not in the instrument as other capacitors that were measured immediately after these occurrences on the same instrument were stable. Measurements were made with and without the guard circuit with similar erratic results.

6. After one week in the temperature-humidity chamber nine of the fifteen components bearing code Ib/A had their metal cases tarnished from five to thirty per cent (area). At the end of the second week the remainder of the cases were tarnished approximately the same amount. At the end of the test period all cases were tarnished 80 to 100 per cent (area).

7. Component IIIa/A/36 had one end broken off, beyond the wire lead, at the start of the test. Component IIIa/A/37 had a chip out of the paint at the start. These flaws apparently had no effect on the survival of the components.

8. After the third week component IIId/A/36 developed a loose lead. This apparently had no effect on the component as measurements during the remainder of the scheduled test period showed normal behaviour as compared to the other components of the same type.

5. RESULTS:

The results of the tests are presented on data sheets in the appendix.

6. REFERENCES:

1. Publication No. 68 (First Edition) of the International Electrotechnical Commission.

2. Publication 40(W-G)1 of the International Electrotechnical Commission, Technical Committee No. 40: Electronic Components, Working Group: Revision Publication No. 68.

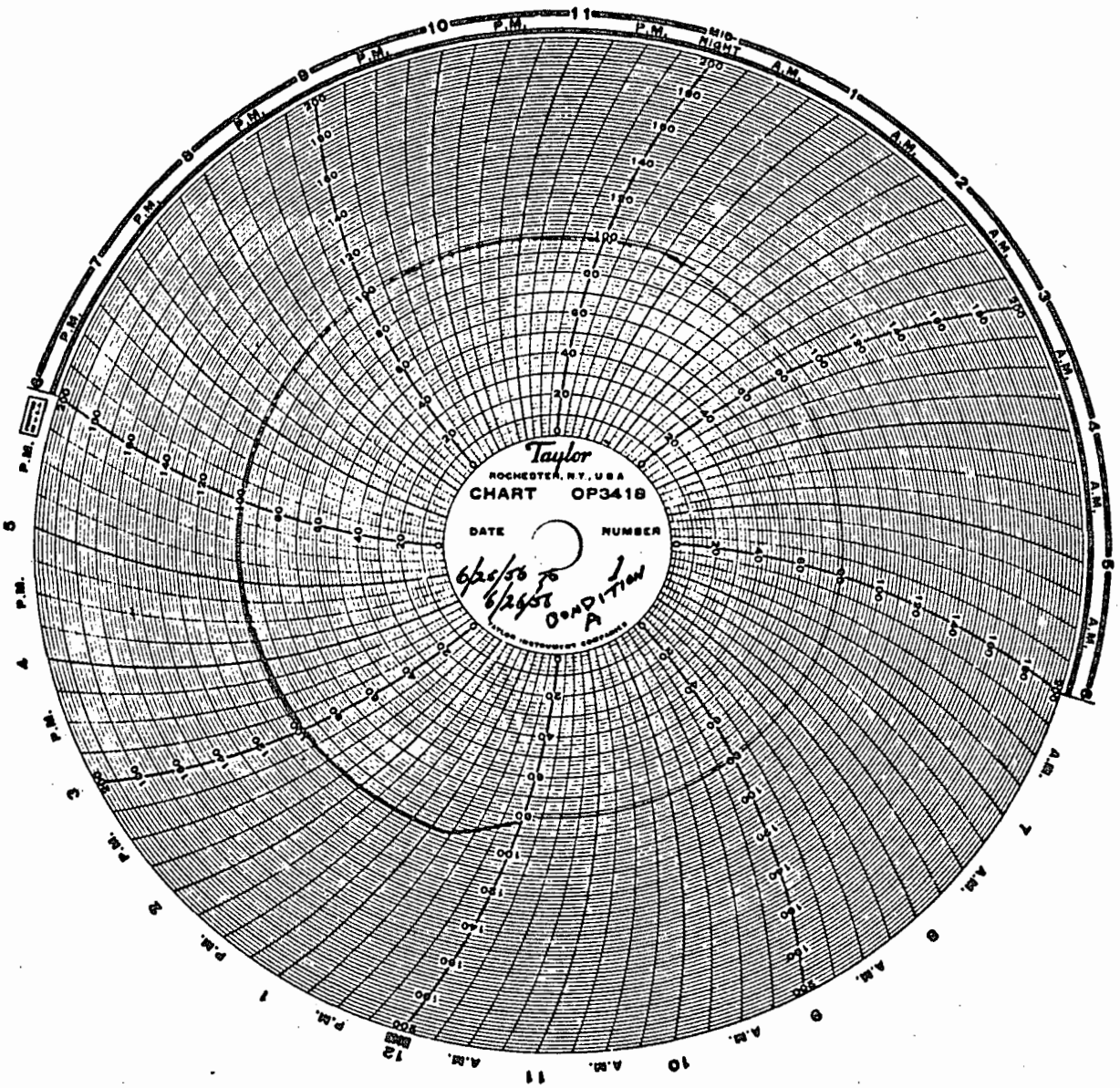



Figure 1. Recorded chart of conditions within humidity chamber during test series A for 24-hour period.

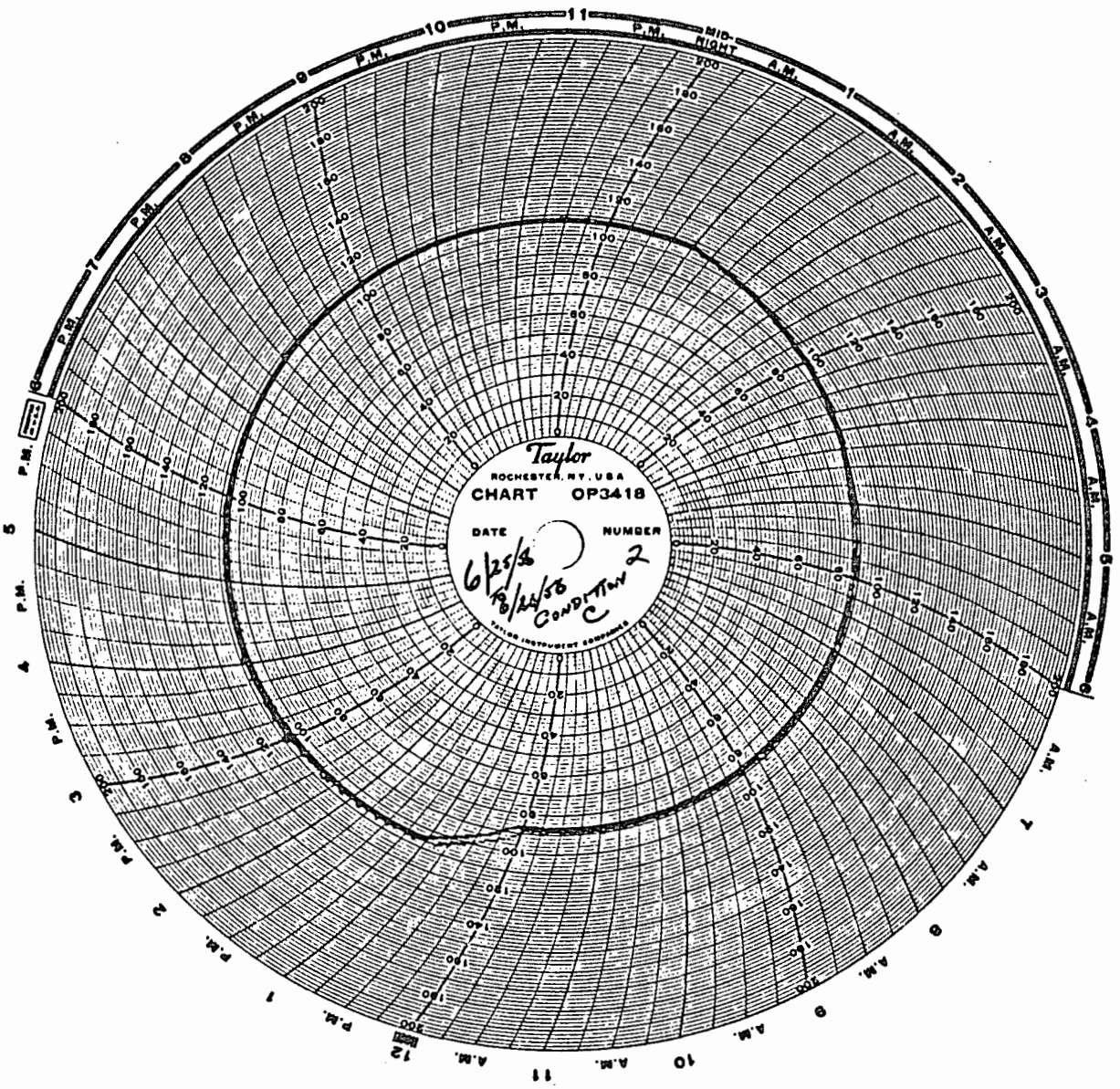



Figure 2. Recorded chart of conditions within humidity chamber during test series C for 24-period.

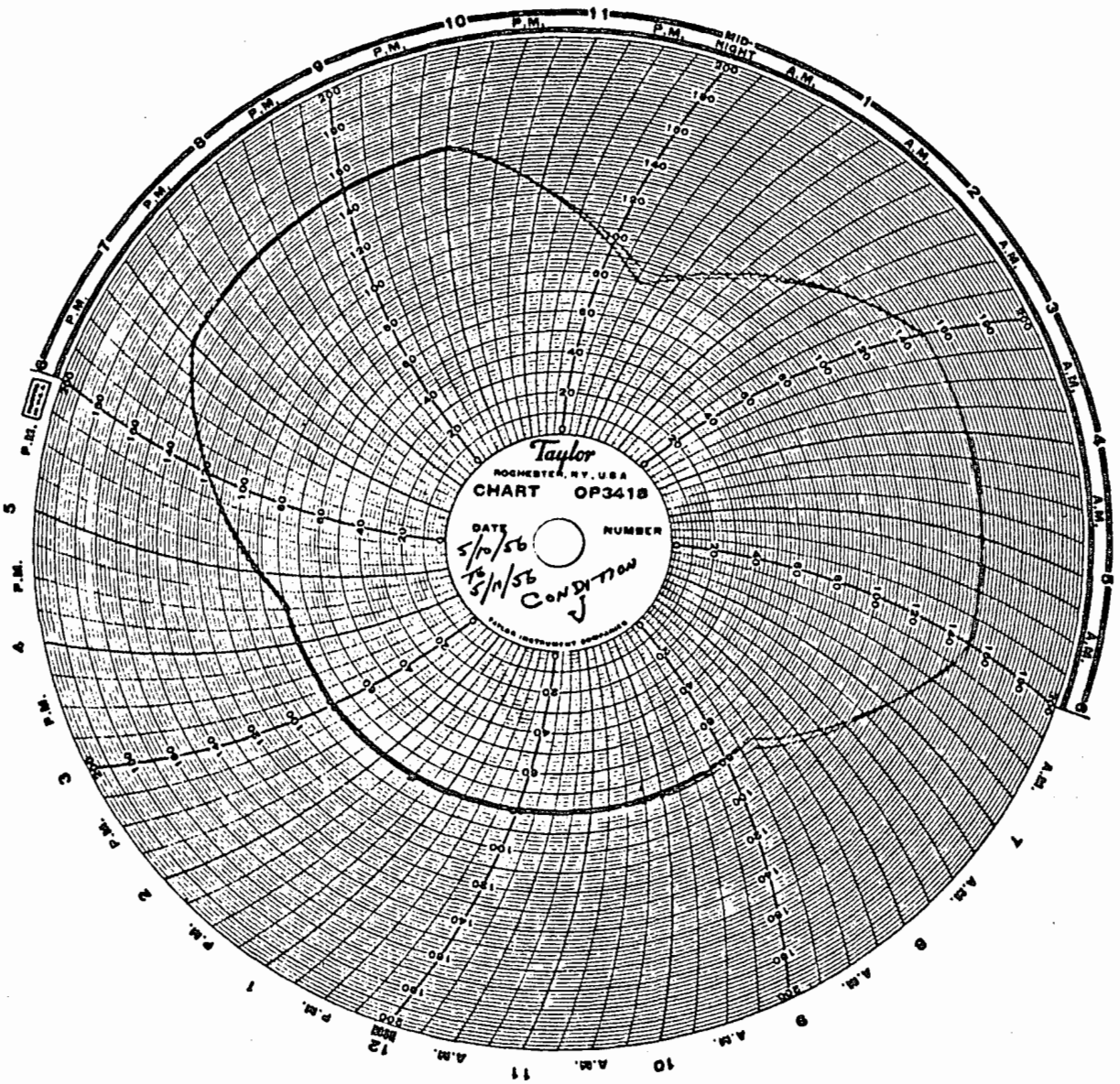



Figure 3. Recorded chart of conditions within humidity chamber during test series C for 24-hour period.

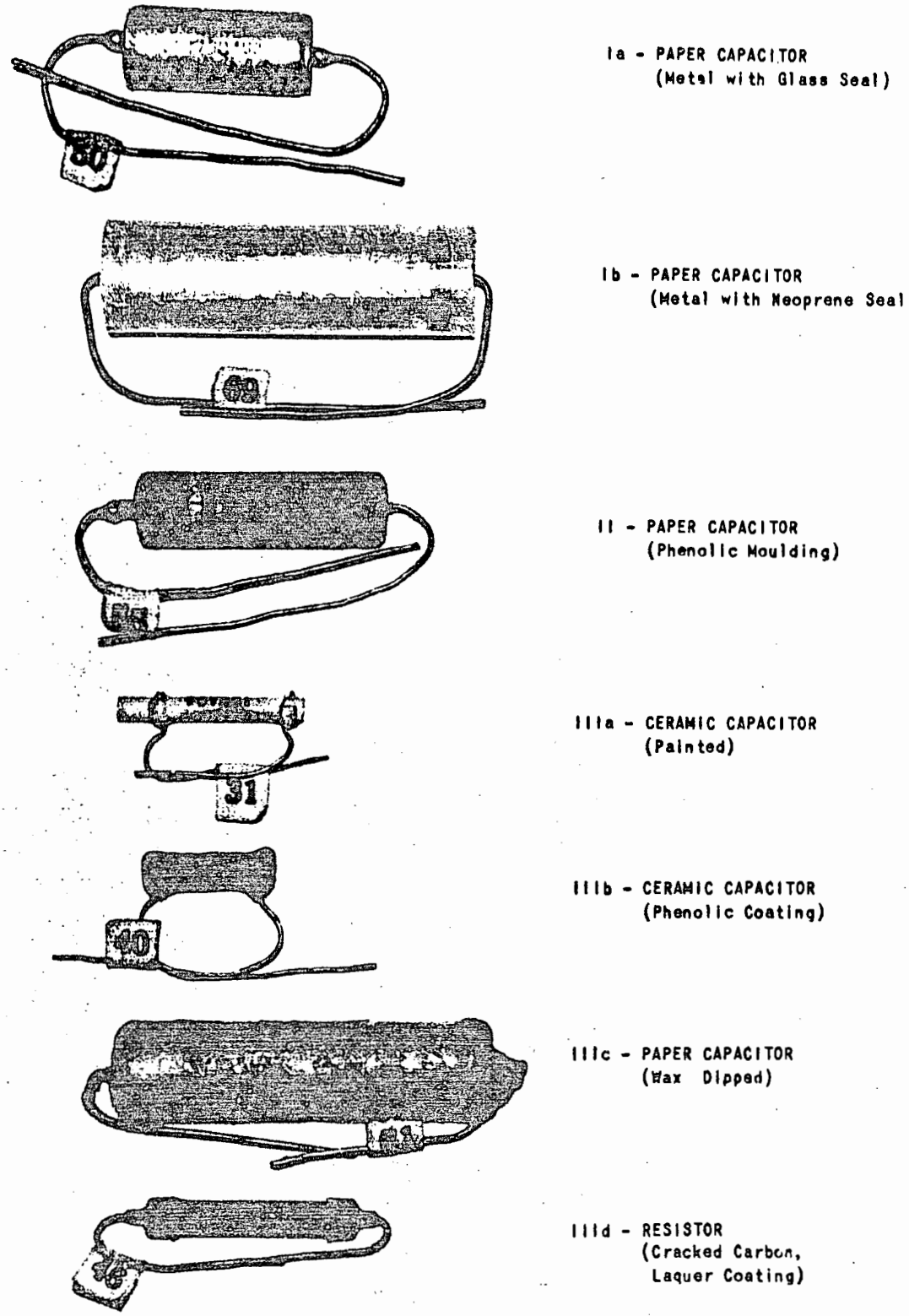
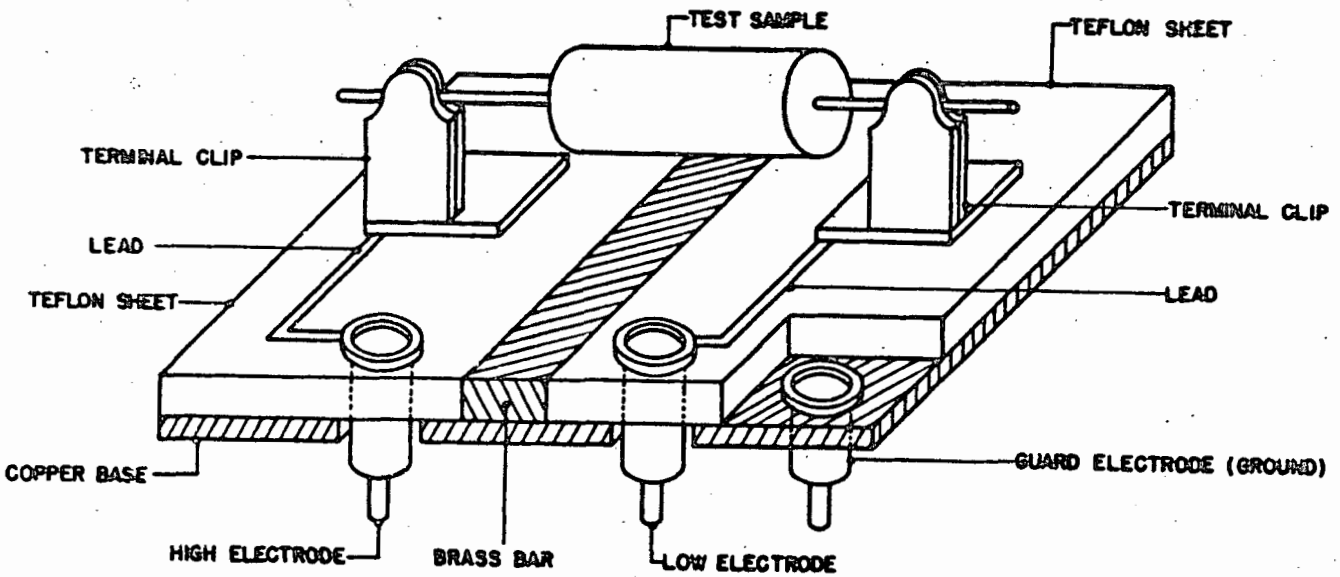
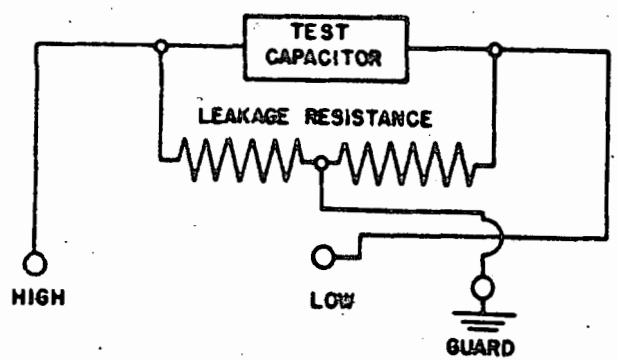



Fig re 4. Physical appearance of components




GUARDED JIG




DESCRIPTION OF OPERATION

The two terminal clips are mounted on individual blocks of teflon which are secured to a copper base plate. A brass bar separates these teflon blocks and is bolted to the base plate. Three plugs are positioned to fit the test jacks on the megohm bridge. The high and low electrodes are connected by heavy copper leads to their respective terminal clips which are insulated from the base plate. The guard electrode is secured to the base plate and is grounded.

The test sample is placed in the terminal clips and rated d.c. voltage is applied across the capacitor terminals. Since the two terminals are separated by the grounded brass bar, there is no possibility for any leakage resistance between the high and low test terminals and the resultant insulation resistance measurement is that actually existing between the two terminals of the capacitor.

Figure 5. Jig for Guarded I.R. Measurements

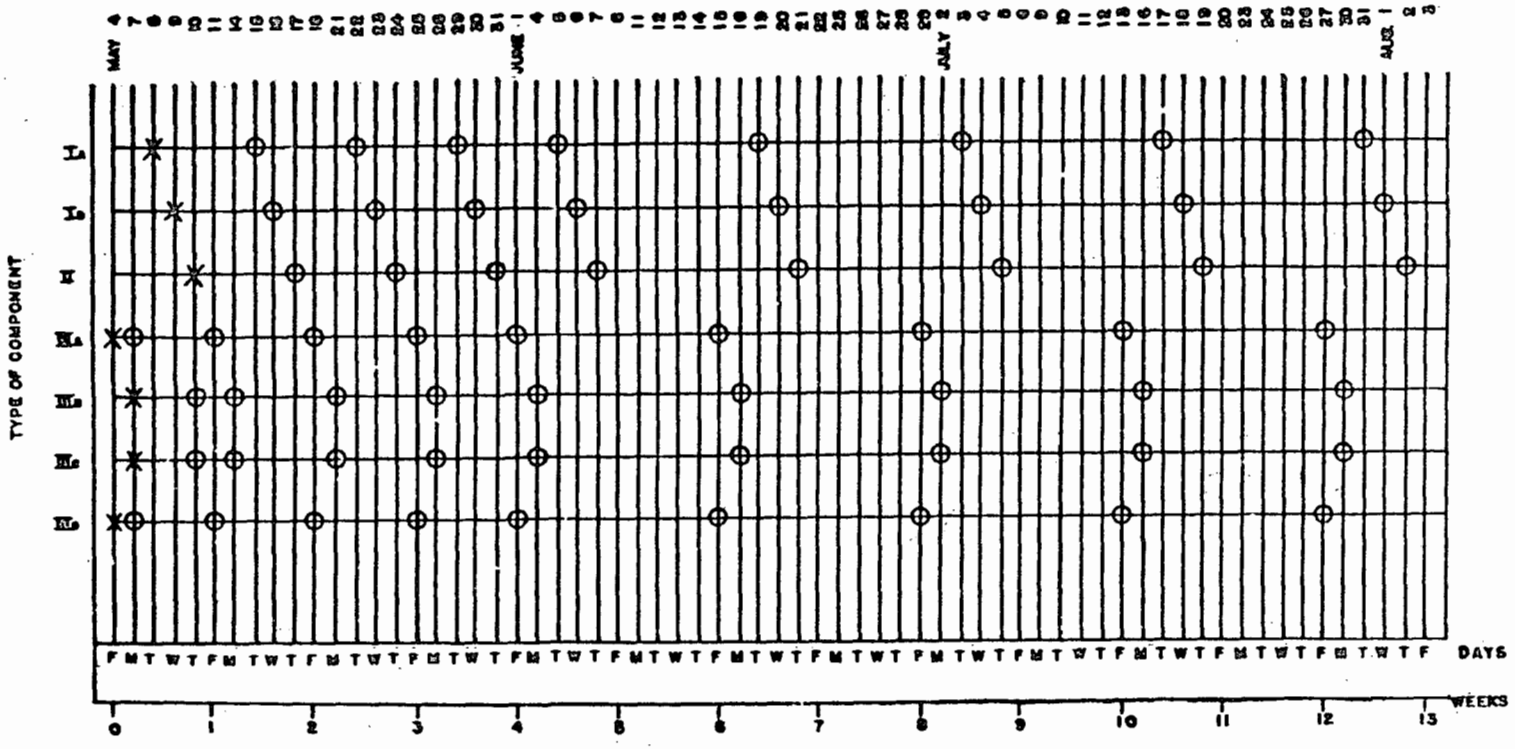



FIG. 6—TEST SERIES & MEASUREMENT INTERVALS

X = INITIAL MEASUREMENT

O = MEASUREMENT

NOTE: SATURDAYS AND SUNDAYS ARE NOT MENTIONED

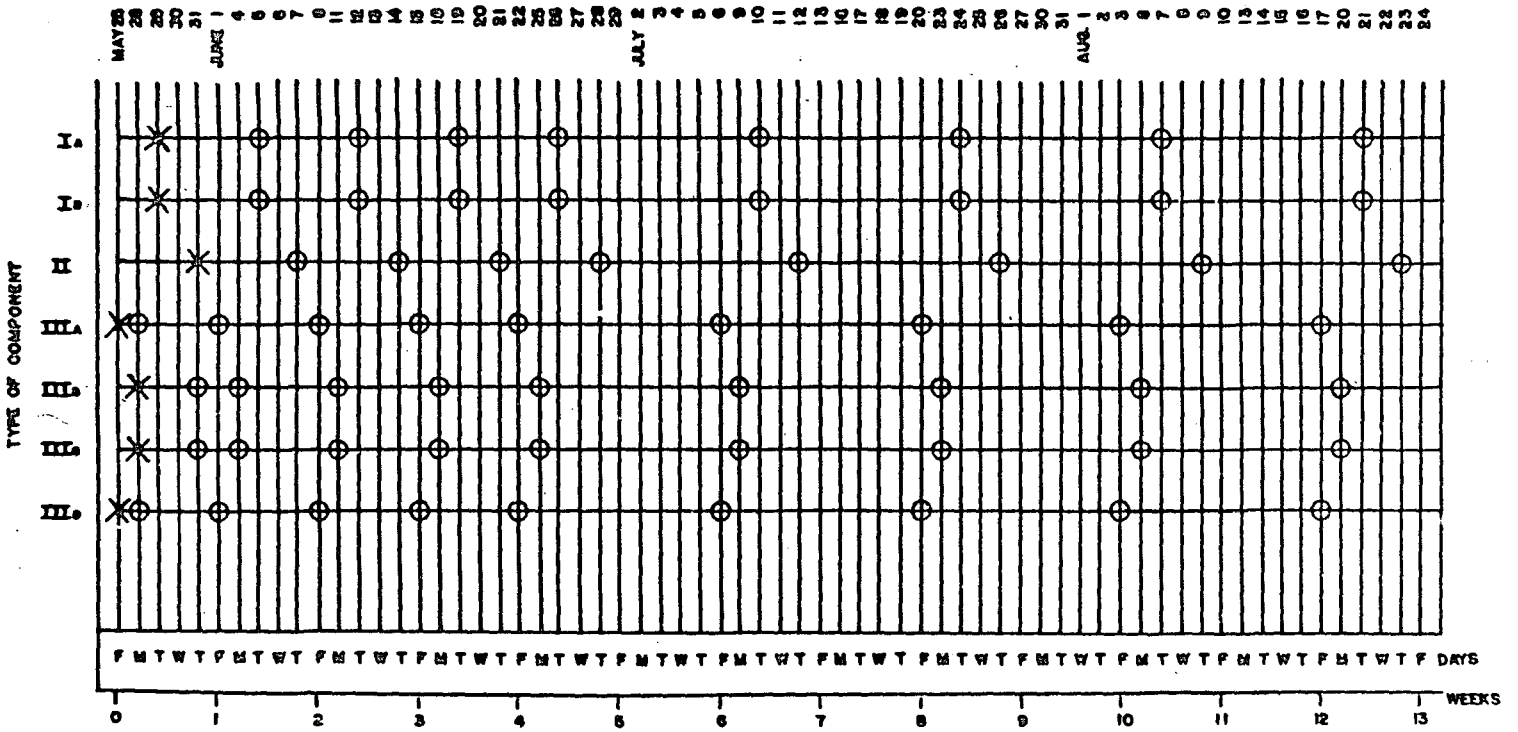



FIG. 7 — TEST SERIES C MEASUREMENT INTERVALS

X = INITIAL MEASUREMENT

O = MEASUREMENT

NOTE: SATURDAYS AND SUNDAYS ARE NOT MENTIONED

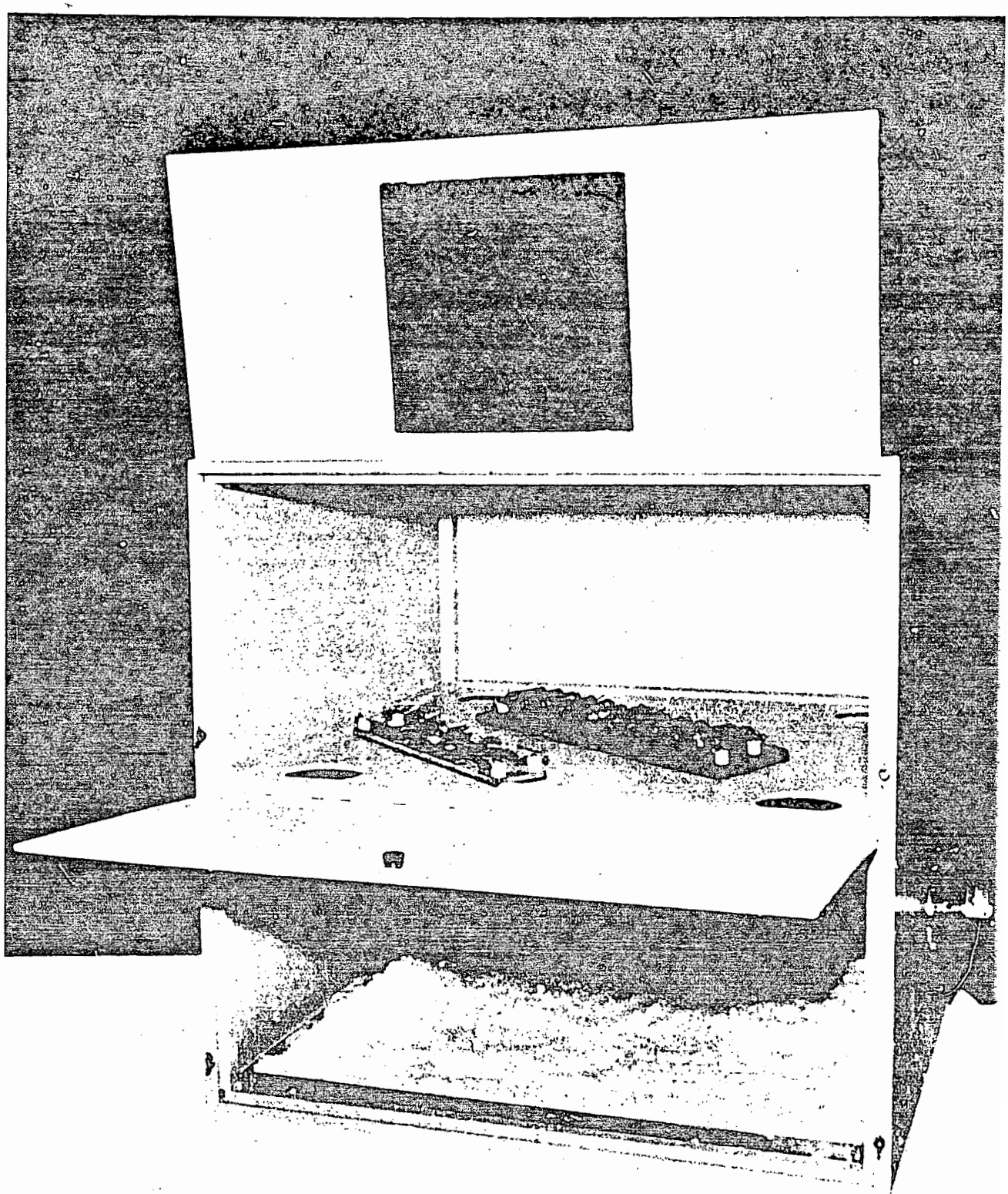


Figure 8. Interior view of standard recovery condition cabinet

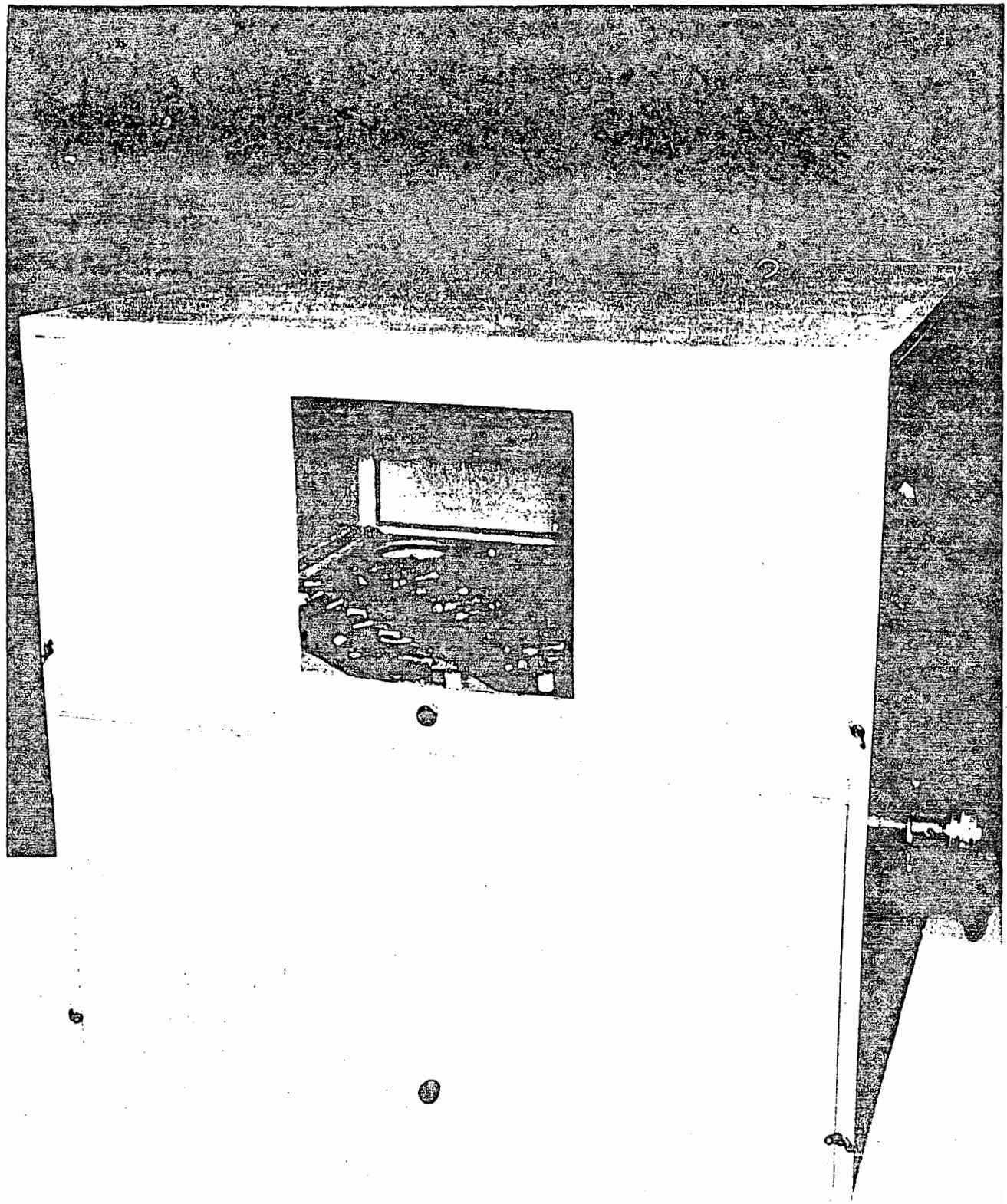


Figure 9. Exterior view of standard recovery condition cabinet

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 1a/A/1

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (METAL WITH GLASS) Capacitance + Tangent of Loss Angle; ~~Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/8/56 | | date: 5/15/56 | | date: 5/22/56 | | date: 5/29/56 | | date: 6/5/56 | | date: 6/19/56 | | date: 7/3/56 | | date: 7/17/56 | | date: 7/31/56 | | date: | |
| | T:23°C RH:58% | | T: 22°C RH:60% | | T:24°C RH: 7% | | T:29°C RH: 56% | | T:26°C RH:46% | | T:21°C RH: 55% | | T:32°C RH: 61% | | T:28°C RH:49% | | T:25°C RH:56% | | T: °C RH: % | |
| | A | B | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A | B |
| 31 | 37.99 | 3.12 | .08 | 2.88 | .21 | 1.38 | .16 | 5.77 | .21 | -.32 | .16 | .96 | 2.16 | -4.49 | .24 | 1.92 | .26 | 2.56 | | |
| 32 | 48.46 | 3.50 | .19 | -2.86 | .29 | -2.67 | .21 | 2.86 | .33 | -5.43 | .23 | -2.00 | .35 | -8.29 | .29 | 0 | .29 | 1.71 | | |
| 33 | 43.13 | 4.50 | .28 | -11.56 | .39 | -14.44 | .28 | -8.67 | .42 | -15.55 | .37 | -14.00 | .53 | -18.89 | .44 | -14.22 | .37 | -9.33 | | |
| 34 | 48.73 | 3.45 | .18 | .29 | .27 | -3.77 | .21 | 3.77 | .31 | -6.38 | .25 | -1.74 | .35 | -7.25 | .29 | -2.03 | .31 | -1.16 | | |
| 35 | 48.68 | 3.40 | .20 | 1.47 | .31 | -1.18 | .23 | 5.29 | .62 | -4.41 | .27 | .29 | .37 | -6.18 | .31 | -.29 | .31 | 6.18 | | |
| 36 | 43.03 | 3.92 | .30 | .76 | .44 | -3.06 | .35 | 2.81 | .93 | -5.10 | .37 | -.76 | .51 | -6.38 | .39 | -.51 | .39 | 1.02 | | |
| 37 | 46.61 | 3.42 | .23 | 2.05 | .31 | -3.51 | .27 | 1.17 | .20 | -5.26 | .27 | -2.63 | .39 | -9.36 | .31 | -3.22 | .31 | 4.68 | | |
| 38 | 48.41 | 3.35 | .16 | 4.18 | .27 | -1.19 | .19 | 4.78 | .25 | -2.39 | .21 | -4.29 | .31 | -3.58 | .28 | 1.49 | .29 | 5.97 | | |
| 39 | 47.89 | 4.45 | .35 | -13.26 | .35 | -11.91 | .29 | -7.86 | .35 | -13.48 | .27 | -13.03 | .42 | -15.96 | .37 | -9.44 | .38 | -11.11 | | |
| 40 | 48.97 | 3.40 | .14 | 2.35 | .24 | -2.65 | .53 | 5.88 | .24 | -3.82 | .18 | -.59 | .33 | -6.47 | .27 | -.59 | .25 | 3.53 | | |
| 41 | 50.20 | 3.35 | -9.80 | 2.39 | .28 | 0 | .22 | 5.97 | .25 | -1.49 | .22 | 1.49 | .34 | -7.76 | .24 | 2.99 | .28 | 6.27 | | |
| 42 | 48.63 | 3.44 | .21 | 3.20 | .29 | -1.16 | .23 | 3.49 | .33 | -4.97 | .25 | -4.74 | .35 | -9.01 | .31 | -2.33 | .28 | 4.65 | | |
| 43 | 49.11 | 3.30 | .20 | 2.73 | .30 | -1.82 | .24 | 3.64 | .31 | -2.12 | .22 | -1.89 | .20 | -5.45 | .34 | -1.82 | .33 | 4.85 | | |
| 44 | 43.47 | 4.10 | .28 | 1.71 | .41 | -2.44 | .30 | 3.66 | .48 | -5.61 | .35 | -1.95 | .55 | -9.27 | .41 | -1.46 | .39 | 4.39 | | |
| 45 | 49.28 | 3.30 | .26 | 3.03 | .49 | -1.21 | .28 | 2.42 | .30 | -3.03 | .28 | -4.55 | .41 | -7.58 | .32 | -.91 | .30 | 4.24 | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF X $10^9$
B = TAN OF LOSS ANG. ; Unit: X 10 - 3

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 18/A/2

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (METAL WITH GLASS) ~~Capacitance Tangent δ~~ Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/8/56 | | date: 5/15/56 | | date: 5/22/56 | | date: 5/29/56 | | date: 6/5/56 | | date: 6/19/56 | | date: 7/3/56 | | date: 7/17/56 | | date: 7/31/56 | | date: | |
| | T:23°C RH:39 % | | T:22 °C RH:60 % | | T: 24°C RH:47% | | T:25°C RH:56 % | | T:28°C RH:46% | | T:21 °C RH: 55% | | T:32°C RH:91 % | | T: 28°C RH:49% | | T:25 °C RH: 56% | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 31 | 180 | 1000 | *1000 | *1000 | 100 | 600 | 225 | 600 | 150 | 600 | 125 | 500 | 100 | 500 | 100 | 400 | 80 | 400 | | |
| 32 | 150 | 700 | 190 | *1000 | 90 | 600 | 150 | 900 | 90 | 600 | 100 | 500 | 150 | 400 | 130 | 400 | 130 | 400 | | |
| 33 | 190 | 600 | 60 | *1000 | 130 | 500 | 300 | 700 | 29 | 600 | 66 | 600 | 55 | 500 | 100 | 500 | 200 | 500 | | |
| 34 | 200 | 700 | 180 | *1000 | 200 | 900 | 170 | 700 | 37 | 600 | 87 | 650 | 79 | 500 | 70 | 500 | 100 | 600 | | |
| 35 | 210 | 600 | 140 | *1000 | 120 | 1000 | 75 | 600 | 80 | 700 | 140 | 600 | 150 | 600 | 190 | 500 | 250 | 600 | | |
| 36 | 120 | 1000 | 180 | *1000 | 100 | 1000 | 125 | 600 | 35 | 500 | 62 | 1000 | 100 | 500 | 100 | 500 | 100 | 500 | | |
| 37 | 110 | 600 | 500 | *1000 | 80 | 1000 | 51 | 500 | 50 | 600 | 180 | 450 | 180 | 400 | 200 | 400 | 190 | 400 | | |
| 38 | 150 | 600 | 60 | 1000 | 85 | 400 | 300 | 800 | 74 | 500 | 57 | 500 | 65 | 400 | 90 | 400 | 110 | 300 | | |
| 39 | 300 | 1000 | *1000 | *1000 | 85 | 500 | 90 | 900 | 100 | 500 | 80 | 600 | 110 | 500 | 150 | 350 | 120 | 500 | | |
| 40 | 110 | 600 | 1000 | *1000 | 110 | 600 | 100 | 1000 | 97 | 700 | 60 | 450 | 55 | 450 | 70 | 400 | 100 | 500 | | |
| 41 | 120 | 800 | 200 | *1000 | 170 | 700 | 200 | 900 | 130 | 600 | 70 | 400 | 64 | 400 | 150 | 500 | 150 | 500 | | |
| 42 | 190 | 900 | 100 | 1000 | 80 | 700 | 190 | 1000 | 120 | 800 | 85 | 500 | 70 | 400 | 180 | 500 | 180 | 600 | | |
| 43 | 100 | 900 | 100 | 1000 | 95 | 1000 | 200 | 600 | 46 | 500 | 65 | 500 | 70 | 500 | 150 | 500 | 170 | 500 | | |
| 44 | 200 | 650 | 180 | *1000 | 100 | 1000 | 90 | 700 | 70 | 700 | 50 | 400 | 100 | 600 | 110 | 600 | 200 | 600 | | |
| 45 | 300 | 500 | 69 | 190 | 120 | 180 | 100 | 150 | 69 | 50 | 75 | 19 | 80 | 17 | 95 | 10.5 | 90 | 8 | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH= relative humidity in laboratory

A = INSULATION RES. ; Unit: MEGOHMS X $10^3$
B = INSULATION RES. ; Unit: MEGOHMS X 103

* Greater than 1000

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 1b/A/1

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (METAL WITH NEOPRENE) Capacitance + Tangent of Loss Angle; ~~Resistance-Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/9/56 | | date: 5/16/56 | | date: 5/23/56 | | date: 5/29/56 | | date: 6/6/56 | | date: 6/20/56 | | date: 7/5/56 | | date: 7/18/56 | | date: 8/1/56 | | date: | |
| | T: 21°C RH: 51% | | T: 25 °C RH: 55% | | T: 22°C RH: 60% | | T: 25°C RH: 56% | | T: 24°C RH: 51% | | T: 25 °C RH: 63% | | T: 24 °C RH: 62% | | T: 24 °C RH: 51% | | T: 29 °C RH: 69% | | T: °C RH: % | |
| | A | B | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A | B |
| 31 | 50.96 | 3.96 | .24 | 3.53 | -.15 | -3.50 | .30 | 8.50 | .10 | -1.50 | .05 | -3.50 | .06 | -2.30 | .02 | -1.30 | -.02 | -1.80 | | |
| 32 | 44.38 | 3.90 | -.14 | 0 | 1.50 | -5.12 | .30 | 5.40 | .06 | -3.30 | .04 | -5.60 | 0 | -4.60 | .13 | -3.80 | -.22 | -5.60 | | |
| 33 | 51.99 | 3.73 | .50 | -1.90 | .40 | -5.30 | .75 | 3.20 | .52 | -2.40 | .21 | -6.10 | .15 | -6.10 | .02 | -6.10 | -.04 | -6.60 | | |
| 34 | 50.61 | 3.93 | .33 | 4.32 | .25 | -4.32 | .61 | 6.10 | 2.31 | -.80 | .02 | -5.80 | -.02 | -5.30 | -.22 | -5.60 | -.38 | -7.80 | | |
| 35 | 52.56 | 4.86 | .32 | -0.20 | .27 | -3.30 | .32 | 5.80 | .17 | -.20 | .08 | -4.10 | -.04 | -4.70 | -.11 | -1.00 | -.19 | -1.60 | | |
| 36 | 46.86 | 3.99 | .04 | -4.51 | 0 | -4.80 | .08 | 3.00 | -.02 | -2.50 | -.13 | -5.80 | -.17 | -4.80 | -.23 | -4.00 | -.34 | -7.30 | | |
| 37 | 48.23 | 3.85 | .22 | -1.03 | 1.20 | -5.20 | .30 | 3.63 | .20 | -1.00 | .04 | -5.40 | 0 | -6.50 | 0 | -2.30 | -.08 | -6.20 | | |
| 38 | 59.06 | 4.24 | .17 | -5.70 | .20 | -2.35 | .33 | 4.00 | .23 | -.70 | .13 | -5.70 | .05 | -3.30 | 0 | -2.30 | -.10 | -7.50 | | |
| 39 | 53.62 | 6.70 | .58 | -1.50 | .50 | -5.22 | .60 | -1.04 | .13 | -12.00 | .31 | -7.80 | .26 | -7.20 | .09 | -9.70 | 0 | -10.40 | | |
| 40 | 47.97 | 4.00 | .38 | 2.50 | .30 | -2.75 | .35 | 2.50 | .33 | 0 | .19 | -4.50 | .08 | -4.70 | .08 | 0 | -.10 | -4.00 | | |
| 41 | 45.62 | 3.90 | .20 | 12.80 | .10 | -5.12 | .10 | -1.50 | .04 | -2.10 | -.13 | -5.60 | -.13 | -4.60 | -.19 | -5.10 | -.26 | -6.10 | | |
| 42 | 57.77 | 4.31 | .24 | -3.01 | .21 | -7.19 | .24 | 2.80 | .19 | -4.00 | .24 | -7.40 | .03 | -9.50 | .07 | -2.30 | .19 | -4.40 | | |
| 43 | 47.44 | 3.95 | .17 | 1.01 | .10 | -3.30 | .06 | -.25 | 0 | -2.30 | -.06 | -3.00 | -.17 | -4.80 | .19 | -3.30 | -.25 | -4.30 | | |
| 44 | 45.48 | 3.95 | .22 | .25 | .07 | -5.31 | .07 | 2.00 | -.06 | -4.00 | -.06 | -4.60 | -.15 | -6.30 | -.24 | -3.80 | -.35 | -5.10 | | |
| 45 | 49.30 | 4.10 | .16 | -1.21 | -.30 | -7.31 | -.39 | -3.90 | -.39 | -5.10 | -.47 | -8.00 | -.49 | -7.30 | -.53 | -6.80 | -.63 | -9.50 | | |

Delete if not applicable.

T = ambient temperature in laboratory.
RH= relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF X $10^{-3}$
B = TAN OF LOSS ANG. ; Unit: X $10^{-3}$

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 1b/A/2

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (METAL WITH NEOPRENE) ~~Capacitance and Tangent of Loss Angle Resistance~~ Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/9/56 | | date: 5/16/56 | | date: 5/23/56 | | date: 5/29/56 | | date: 6/6/56 | | date: 6/20/56 | | date: 7/5/56 | | date: 7/18/56 | | date: 8/1/56 | | date: | |
| | T: 21°C RH: 51 % | | T: 25 °C RH: 55% | | T: 22°C RH: 60 % | | T: 25°C RH: 56 % | | T: 24°C RH: 51 % | | T: 25°C RH: 63 % | | T: 24°C RH: 62% | | T: 24 °C RH: 51% | | T: 29°C RH: 69% | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 31 | 5[illegible] | 1000 | 53 | 700 | 37 | 1000 | 36 | 1000 | 48 | 700 | 32 | 700 | 37 | 600 | 34 | 400 | 25 | 400 | | |
| 32 | 70 | 900 | 40 | 600 | 55 | 700 | 51 | 1000 | 35 | 400 | 28 | 800 | 43 | 600 | 30 | 600 | 17 | 200 | | |
| 33 | 68 | 6[illegible] | 34 | 1000 | 30 | 900 | 28 | 1000 | 44 | 500 | 35 | 400 | 28 | 190 | 16.5 | 500 | 7 | 200 | | |
| 34 | 50 | 1[illegible] | 36 | 700 | 20 | 800 | 30 | 1000 | 47 | 600 | 35 | 600 | 28 | 500 | 17 | 500 | 7.6 | 300 | | |
| 35 | 32 | 9[illegible] | 1.85 | 1000 | 2.2 | 800 | 1.4 | 1000 | 1.25 | 500 | .5 | 500 | .21 | 600 | .073 | 500 | .056 | 500 | | |
| 36 | 42 | 6[illegible] | 54 | 1000 | 47 | 600 | 39 | 1000 | 35 | 500 | 33 | 800 | 37 | 700 | 10 | 600 | 3.6 | 400 | | |
| 37 | 70 | 1000 | 65 | 1000 | 50 | 600 | 45 | 1000 | 45 | 800 | 45 | 600 | 55 | 800 | 38 | 500 | 20 | 300 | | |
| 38 | 49 | 8[illegible] | 36 | 900 | 41 | 190 | 42 | 1000 | 33 | 700 | 31 | 500 | 33 | 600 | 24 | 600 | 19 | 500 | | |
| 39 | 52 | 1[illegible] | 31 | 700 | 36 | 700 | 47 | 1000 | 38 | 500 | 36 | 600 | 29 | 500 | 18 | 400 | 10 | 400 | | |
| 40 | 45 | 9[illegible] | 39 | 600 | 54 | 1000 | 31 | 1000 | 30 | 500 | 39 | 700 | 37 | 300 | 26 | 400 | 24 | 400 | | |
| 41 | 5[illegible] | 1[illegible] | 32 | 1000 | 44 | 600 | 41 | 1000 | 44 | 600 | 43 | 900 | 38 | 500 | 14 | 400 | 9.5 | 250 | | |
| 42 | 51 | 800 | 39 | 1000 | 38 | 600 | 61 | 1000 | 46 | 700 | 36 | 500 | 30 | 500 | 17 | 500 | 11 | 400 | | |
| 43 | 85 | 500 | 32 | 1000 | 39 | 600 | 58 | 1000 | 56 | 600 | 31 | 900 | 23 | 700 | 9 | 500 | 2 | 300 | | |
| 44 | 54 | 6[illegible] | 60 | 1000 | 50 | 1000 | 47 | 1000 | 42 | 1000 | 39 | 900 | 46 | 900 | 29 | 500 | 23 | 400 | | |
| 45 | 56 | 7[illegible] | 40 | 1000 | 30 | 700 | 29 | 1000 | 34 | 500 | 25 | 800 | 31 | 700 | 23 | 500 | 23 | 500 | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INSULATION RES. ; Unit: MEGOHMS X $10^3$
B = INSULATION RES. ; Unit: MEGOHMS X $10^3$

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 11/A/1

# TEST REPORT
Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (PHENOLIC MOULDING) Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/10/56 | | date: 5/17/56 | | date: 5/24/56 | | date: 5/31/56 | | date: 6/7/55 | | date: 6/21/56 | | date: 7/5/56 | | date: 7/19/56 | | date: 8/2/56 | | date: | |
| | T: 21°C RH: 51 % | | T: 24 °C RH: 47 % | | T: 16°C RH: 58 % | | T: 23°C RH: 55 % | | T: 28°C RH: 48 % | | T: 22 °C RH: 56 % | | T: 24 °C RH: 62 % | | T: 29°C RH: 49 % | | T: 25°C RH: 56 % | | T: °C RH: % | |
| | A | B | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A | B |
| 31 | 6.835 | 3.45 | .23 | -4.05 | -.09 | 8.69 | .23 | -8.11 | -.13 | -2.90 | -.06 | -4.00 | -.09 | -.90 | .02 | -4.35 | -.18 | 2.61 | | |
| 32 | 6.514 | 3.40 | .26 | -5.00 | -.06 | 8.00 | .20 | -8.82 | -.09 | -1.20 | .02 | -4.40 | -.18 | 1.50 | -.05 | -5.00 | -.25 | 0.59 | | |
| 33 | 7.969 | 4.48 | .21 | -2.00 | -.25 | 8.00 | .13 | -5.60 | 0 | -2.00 | -.20 | 0.20 | -.36 | 2.70 | -.18 | -3.79 | -.46 | 2.68 | | |
| 34 | 6.564 | 3.41 | .18 | -3.22 | -.15 | 8.21 | .08 | -8.50 | -.04 | -3.00 | -.21 | -1.50 | -.33 | -.60 | -.29 | -3.52 | -.49 | 0.59 | | |
| 35 | 6.390 | 3.33 | .14 | -1.50 | -.14 | 8.40 | .08 | -7.90 | -.03 | -2.40 | -.13 | -3.60 | -.30 | 1.50 | -.25 | -3.90 | -.27 | 2.10 | | |
| 36 | 6.576 | 3.38 | .18 | -2.07 | -.06 | 7.10 | .12 | -7.70 | -.06 | -3.00 | -.08 | -0.90 | -.21 | 3.20 | -.08 | -4.14 | -.28 | 2.07 | | |
| 37 | 6.764 | 3.40 | .19 | -2.70 | -.04 | 6.00 | .13 | -6.50 | -.06 | -3.20 | -.04 | -0.30 | -.10 | 0 | -.04 | -3.23 | -.25 | 2.94 | | |
| 38 | 6.507 | 3.39 | .09 | -.88 | -.09 | 4.12 | .09 | -8.30 | -.02 | -5.30 | -.43 | 0.30 | -.32 | 1.20 | -.18 | -4.13 | -.46 | 2.65 | | |
| 39 | 6.724 | 3.28 | .19 | -3.35 | -.03 | 6.70 | .07 | -8.00 | -.03 | .60 | -.15 | -2.70 | -.30 | .90 | -.24 | -3.66 | -.39 | 1.83 | | |
| 40 | 6.514 | 3.38 | .15 | -1.50 | -.01 | 7.10 | .11 | -8.00 | -.02 | -2.40 | -.17 | 0.30 | -.26 | .90 | -.17 | -3.55 | -.38 | 0.89 | | |
| 41 | 6.509 | 3.26 | .11 | 1.22 | -.17 | 10.12 | 0 | -6.00 | -7.80 | -.61 | -.26 | -0.90 | -.40 | 1.20 | -.34 | -1.84 | -.54 | 3.68 | | |
| 42 | 6.957 | 3.40 | -.07 | -3.00 | -.04 | 6.50 | .14 | -7.40 | -.03 | -.90 | -.05 | -1.20 | -.13 | -.30 | -.06 | -5.88 | -.27 | 1.47 | | |
| 43 | 6.958 | 3.45 | .04 | -3.80 | -.26 | 3.41 | .04 | -9.30 | -.01 | -4.10 | -.03 | 15.30 | .01 | -1.40 | .23 | -3.48 | -.09 | 7.25 | | |
| 44 | 7.922 | 4.19 | .27 | -2.62 | -.10 | 7.40 | .21 | -7.00 | .08 | -1.70 | .01 | -1.90 | -.16 | 2.40 | .10 | -4.29 | -.11 | 3.34 | | |
| 45 | 7.278 | 3.94 | .18 | -.500 | 0 | 6.34 | .30 | -6.10 | .29 | -2.80 | .23 | -2.00 | .16 | .20 | .34 | -3.55 | .16 | 1.52 | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF X $10^3$
B = TAN OF LOSS ANG ; Unit: X $10^{-3}$

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 11/A/2

**TEST REPORT**
Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (PHENOLIC MOULDING) ~~Capacitance - Tangent of Loss Angle, Resistance~~, Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/10/56 | | date: 5/17/56 | | date: 5/24/56 | | date: 5/31/56 | | date: 6/7/56 | | date: 6/21/56 | | date: 7/5/56 | | date: 7/19/56 | | date: 8/2/56 | | date: | |
| | T: 21 °C RH: 51 % | | T: 24 °C RH: 47 % | | T: 16 °C RH: 58 % | | T: 23 °C RH: 53 % | | T: 28 °C RH: 48 % | | T: 22 °C RH: 56 % | | T: 24 °C RH: 62 % | | T: 29 °C RH: 49 % | | T: 25 °C RH: 56 % | | T: °C RH: % | |
| | A | B | % A | B | % A | B | % A | B | % A | B | % A | B | % A | B | % A | B | % A | B | A | B |
| 31 | 300 | | -95.8 | | -97.0 | | -98.7 | | -98.6 | | -99.3 | | -99.5 | | -99.7 | | -99.7 | | | |
| 32 | 500 | | -97.0 | | -98.7 | | -99.3 | | -99.1 | | -99.6 | | -99.5 | | -99.8 | | -99.8 | | | |
| 33 | 500 | | -97.1 | | -98.6 | | -99.5 | | -99.4 | | -99.6 | | -99.7 | | -99.9 | | -99.9 | | | |
| 34 | 200 | | -92.5 | | -95.1 | | -98.3 | | -97.6 | | -98.4 | | -99.6 | | -99.7 | | -99.7 | | | |
| 35 | 500 | | -97.4 | | -98.7 | | -99.4 | | -99.3 | | -99.5 | | -99.7 | | -99.8 | | -99.8 | | | |
| 36 | 1000 | | -98.9 | | -99.2 | | -99.7 | | -99.6 | | -99.8 | | -99.8 | | -99.9 | | -99.9 | | | |
| 37 | 300 | | -96.3 | | -98.0 | | -99.1 | | -99.0 | | -99.5 | | -99.5 | | -99.8 | | -99.8 | | | |
| 38 | 500 | | -97.6 | | -98.0 | | -98.8 | | -99.3 | | -99.7 | | -99.7 | | -97.9 | | -99.9 | | | |
| 39 | 400 | | -97.8 | | -98.3 | | -99.0 | | -99.1 | | -99.4 | | -99.5 | | -99.8 | | -99.8 | | | |
| 40 | 500 | | -96.2 | | -97.6 | | -99.3 | | -99.1 | | -99.5 | | -99.7 | | -99.8 | | -99.8 | | | |
| 41 | 500 | | -97.4 | | -98.7 | | -99.0 | | -98.0 | | -99.3 | | -99.4 | | -96.7 | | -99.7 | | | |
| 42 | 300 | | -96.0 | | -97.3 | | -98.7 | | -98.7 | | -99.3 | | -99.5 | | -99.8 | | -99.8 | | | |
| 43 | 1000 | | -99.0 | | -99.4 | | -99.7 | | -99.7 | | -99.8 | | -99.9 | | -99.9 | | -99.9 | | | |
| 44 | 400 | | -97.3 | | -97.7 | | -98.9 | | -98.8 | | -99.4 | | -99.1 | | -99.7 | | -99.5 | | | |
| 45 | 300 | | -33.3 | | 0 | | -33.3 | | -33.3 | | -16.7 | | -43.3 | | -43.3 | | -33.3 | | | |

*Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INSULATION RES. ; Unit: MEGOHMS X $10^3$
B = ; Unit:

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111a/A/1

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: CERAMIC CAPACITORS (PAINTED). Capacitance + Tangent of Loss Angle; ~~Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/4/56 | | date: 5/7/56 | | date: 5/11/56 | | date: 5/18/56 | | date: 5/25/56 | | date: 6/1/56 | | date: 6/15/56 | | date: 6/29/56 | | date: 7/13/56 | | date: 7/27/56 | |
| | T: 21 °C RH 50 % | | T: 24 °C RH 47 % | | T: 22 °C RH 49 % | | T: 23 °C RH 61 % | | T: 23 °C RH: 46 % | | T: 22 °C RH: 57 % | | T: 22 °C RH: 60 % | | T: 22 °C RH: 53 % | | T: 22 °C RH: 56 % | | T: 24 °C RH 56 % | |
| | A | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B |
| 31 | 100.9 | 0.10 | 0.99 | 0.65 | 1.09 | 0.75 | 1.38 | 1.25 | 1.58 | 1.41 | 1.68 | 1.65 | 1.88 | 0.97 | 2.08 | 2.50 | 2.28 | 3.10 | 2.38 | 3.62 |
| 32 | 99.8 | 0.11 | 1.30 | 0.63 | 1.60 | 0.82 | 1.50 | 0.98 | 1.70 | 1.24 | 1.90 | 1.81 | 2.20 | 2.17 | 2.50 | 2.29 | 2.70 | 2.59 | 3.01 | 3.07 |
| 33 | 101.7 | 0.12 | 1.17 | 0.77 | 2.26 | 1.58 | 1.86 | 1.21 | 1.67 | 1.32 | 1.37 | 1.37 | 1.57 | 1.81 | 1.87 | 1.95 | 2.06 | 2.35 | 2.26 | 2.84 |
| 34 | 97.4 | 0.15 | 1.64 | 6.07 | 3.32 | 1.18 | 6.36 | 13.95 | 10.20 | 15.90 | 14.47 | 24.22 | 15.91 | 24.94 | 23.61 | 35.05 | RFT—LOW | | IR | - |
| 35 | 102.1 | 0.17 | 1.46 | 1.06 | 1.37 | 0.40 | 1.56 | 1.43 | 1.37 | 1.13 | 1.56 | 1.98 | 1.86 | 2.30 | 2.45 | 2.84 | 2.94 | 3.68 | 3.13 | 4.32 |
| 36 | 99.6 | 0.11 | 0.60 | 0.41 | 0.80 | 0.51 | 0.90 | 0.72 | 1.00 | 0.90 | 1.10 | 1.37 | 1.40 | 1.64 | 1.51 | 1.83 | 2.11 | 2.52 | 2.01 | 2.85 |
| 37 | 99.2 | 0.07 | 0.80 | 0.63 | 0.80 | 0.58 | 0.90 | 0.66 | 0.90 | 0.59 | 1.00 | 0.79 | 0.70 | 0.69 | 0.81 | 0.79 | 1.00 | .88 | .91 | 1.01 |
| 38 | 95.0 | 0.20 | 2.30 | 4.07 | 3.47 | 5.58 | 4.84 | 7.00 | 6.52 | 10.38 | 8.31 | 13.52 | 11.47 | 18.34 | 22.10 | 33.35 | RFT—LOW | | IR | - |
| 39 | 99.1 | 0.07 | 0.50 | 0.37 | 0.60 | 0.37 | 0.60 | 0.38 | 0.40 | 0.24 | 0.30 | 0.18 | 0.20 | 0.25 | 0.30 | 0.24 | 0.50 | 0.41 | 0.40 | 0.65 |
| 40 | 100.8 | 0.12 | 1.58 | 0.94 | 1.19 | 0.83 | 1.78 | 1.10 | 1.78 | 1.47 | 1.78 | 1.84 | 1.70 | 2.22 | 2.58 | 2.96 | 2.97 | 3.91 | 2.98 | 3.97 |
| 41 | 101.7 | 0.09 | 0.78 | 0.49 | 0.98 | 0.63 | 1.08 | 0.85 | 1.08 | 1.08 | 1.37 | 1.60 | 1.87 | 2.17 | 2.10 | 2.37 | 2.36 | 2.61 | 2.55 | 3.32 |
| 42 | 101.3 | 0.09 | 0.59 | 0.47 | 1.08 | 0.56 | 1.08 | 0.84 | -.98 | 0.76 | 1.18 | 1.03 | 1.18 | 1.28 | 1.40 | 1.41 | 1.58 | 1.66 | 1.77 | 2.13 |
| 43 | 99.8 | 0.12 | 0.70 | 1.07 | 0.70 | 1.17 | 1.50 | 1.74 | 1.90 | 2.33 | 2.30 | 3.10 | 2.60 | 3.72 | 3.00 | 4.19 | 3.61 | 5.23 | 3.81 | 6.01 |
| 44 | 103.4 | 0.11 | 0.58 | 0.58 | 0.71 | 0.61 | 0.87 | 0.83 | 0.96 | 1.08 | 1.25 | 1.41 | 1.64 | 1.94 | 1.93 | 2.14 | 2.24 | 2.69 | 2.23 | 3.09 |
| 45 | 99.4 | 0.06 | 0.40 | 0.16 | 0.40 | 0.37 | 0.40 | 0.35 | 0.40 | 0.18 | 0.40 | 0.30 | 0.30 | 0.29 | 0.40 | 0.35 | 0.60 | 0.59 | 0.60 | 0.74 |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF
B = TAN OF LOSS ANGLE ; Unit: X 10 - 3

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111a/A/2

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: COEAMIC CAPACITORS (PAINTED) ~~Capacitance / Tangent of Loss Angle / Resistance, Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas. | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/4/56 | | date: 5/7/56 | | date: 5/11/56 | | date: 5/18/56 | | date: 5/25/56 | | date: 6/1/56 | | date: 6/15/56 | | date: 6/29/56 | | date: 7/13/56 | | date: 7/27/56 | |
| | T: 21°C RH: 50% | | T: 24 °C RH: 41% | | T: 22°C RH 49% | | T: 23°C RH: 61 % | | T: 23°C RH: 46% | | T: 22°C RH: 57 % | | T: 22°C RH 60% | | T 22 °C RH: 55% | | T: 22 °C RH: 56% | | T: 24°C RH: 66 % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 31 | 1000 | | -94.0 | | 97.5 | | -98.4 | | -93.8 | | -97.3 | | -91.0 | | -98.8 | | -99.9 | | -99.9 | |
| 32 | 1000 | | -97.0 | | -99.6 | | -95.8 | | -89.0 | | -95.1 | | -94.0 | | -97.9 | | -99.6 | | -99.7 | |
| 33 | 750 | | -89.3 | | -99.7 | | -98.6 | | -93.3 | | -95.2 | | -86.6 | | -88.7 | | -98.3 | | -99.9 | |
| 34 | 500 | | -99.7 | | -99.6 | | -98.9 | | -99.8 | | -99.9 | | -99.9 | | -99.9 | RFT-IR Below 100 MEG. | | | | |
| 35 | 500 | | -96.0 | | -60.0 | | -40.0 | | -20.0 | | -80.0 | | -68.0 | | -62.0 | | -98.6 | | -98.0 | |
| 36 | 750 | | -74.7 | | -99.9 | | -92.0 | | -96.6 | | -92.4 | | -76.0 | | -73.3 | | -98.3 | | -97.1 | |
| 37 | 1000 | | -91.5 | | -95.0 | | -90.0 | | -60.0 | | -96.2 | | -80.0 | | -70.0 | | -88.0 | | -95.0 | |
| 38 | 750 | | -98.3 | | -99.4 | | -99.8 | | -99.9 | | -99.9 | | -99.9 | | -99.0 | RFT-IR Below 100 MEG. | | | | |
| 39 | 1000 | | -82.0 | | -98.8 | | -95.9 | | -81.0 | | -89.0 | | -80.0 | | -80.0 | | -86.0 | | -89.0 | |
| 40 | 1000 | | -98.3 | | -99.2 | | -98.7 | | -99.7 | | -99.8 | | -99.9 | | -99.9 | | -99.9 | | -99.8 | |
| 41 | 1000 | | -99.4 | | -99.7 | | -98.0 | | -92.4 | | -95.0 | | -70.0 | | -70.0 | | -81.0 | | -86.0 | |
| 42 | 750 | | -94.4 | | -99.8 | | -98.0 | | -97.4 | | -96.4 | | -89.5 | | -85.3 | | -95.3 | | -97.2 | |
| 43 | 750 | | -98.7 | | -99.8 | | -99.4 | | -99.4 | | -99.6 | | -99.1 | | -99.2 | | -99.3 | | -99.6 | |
| 44 | 1000 | | -70.0 | | -88.0 | | -70.0 | | -10.0 | | -89.0 | | -70.0 | | -70.0 | | -75.0 | | -85.0 | |
| 45 | 1000 | | -87.0 | | -94.0 | | -95.0 | | -75.0 | | -94.3 | | -90.5 | | -91.0 | | -94.0 | | -97.3 | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = RESISTANCE, INS. ; Unit: MEGOHMS X $10^3$
B = ; Unit:

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111b/A/1

**TEST REPORT**
Humidity test for Components

Test Laboratory: U.S. TESTING CO. INC. Country: U.S.A.

Type of Component: CERAMIC CAPACITORS (PHENOLIC COATING) Capacitance + Tangent of Loss Angle; ~~Resistance-Insulation-Resistance~~

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/7/56 | | date: 5/10/56 | | date: 5/14/56 | | date: 5/21/56 | | date: 5/28/56 | | date: 6/4/56 | | date: 6/18/56 | | date: 7/2/56 | | date: 7/16/56 | | date: 7/30/56 | |
| | T: 22°C RH: 52 % | | T: 22 °C RH: 45 % | | T: 22°C RH: 48 % | | T: 21°C RH: 47 % | | T: 23°C RH: 46 % | | T: 22 °C RH: 52 % | | T: 22 °C RH: 56% | | T: 22°C RH: 60 % | | T: 22 °C RH: 56 % | | T: 24°C RH: 55% | |
| | A | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B |
| 31 | 93.1 | .17 | .43 | .04 | .21 | .01 | .43 | .11 | .32 | .12 | .21 | .02 | .11 | .13 | .43 | .13 | .32 | .23 | .22 | .41 |
| 32 | 95.4 | .16 | .43 | .01 | .42 | .04 | .52 | .09 | .42 | .14 | .21 | .04 | 0 | .10 | .52 | .10 | .42 | .22 | .21 | .48 |
| 33 | 104.0 | .16 | -.77 | .02 | .38 | .01 | 38 | .11 | .38 | .34 | .19 | .04 | .19 | .15 | .29 | .17 | .38 | .16 | .10 | .38 |
| 34 | 102.6 | .17 | .20 | .03 | .49 | .02 | 2.34 | .15 | .49 | .36 | .10 | .09 | .10 | .15 | .19 | .10 | .58 | .12 | .10 | .40 |
| 35 | 103.9 | .18 | .36 | .01 | .29 | .01 | .48 | .04 | .39 | .09 | .29 | .03 | .19 | .08 | .29 | .08 | .48 | .08 | 0 | .33 |
| 36 | 101.8 | .20 | .49 | .01 | .59 | .05 | .49 | .10 | .49 | .08 | .39 | .04 | .29 | .04 | .39 | .06 | .49 | .12 | .38 | .45 |
| 37 | 103.2 | .20 | .39 | .02 | .19 | .06 | .29 | .16 | .29 | .21 | .19 | .08 | .19 | .12 | .09 | .18 | .48 | .19 | .20 | .50 |
| 38 | 97.8 | .15 | .51 | .04 | .61 | .04 | .51 | .06 | .51 | .29 | 0 | .04 | .10 | .07 | .31 | .07 | .41 | .05 | 0 | .29 |
| 39 | 102.4 | .20 | .39 | .03 | .39 | .01 | .49 | .11 | .39 | .16 | .20 | .10 | 0 | .11 | .29 | .15 | .29 | .13 | .20 | .33 |
| 40 | 96.4 | .16 | .10 | .04 | .52 | .17 | .72 | .39 | .94 | 1.36 | 1.25 | 1.83 | -.31 | .91 | .62 | .85 | .83 | 1.30 | .73 | .50 |
| 41 | 97.8 | .15 | .10 | .02 | .31 | .02 | .41 | .06 | .31 | .04 | .10 | .01 | .10 | .07 | .31 | .15 | .20 | .23 | .10 | .41 |
| 42 | 98.5 | .16 | .10 | .04 | .10 | .01 | .31 | .11 | .20 | .15 | 0 | .09 | .10 | .08 | .30 | .10 | .30 | .14 | 0 | .42 |
| 43 | 105.9 | .19 | .38 | .03 | .47 | .03 | .47 | .09 | .47 | .10 | -.09 | .06 | .09 | .09 | .28 | .07 | .28 | .13 | 0 | .32 |
| 44 | 103.3 | .13 | .29 | .01 | .29 | .04 | .29 | .08 | .29 | .11 | -.10 | .07 | .09 | .09 | .29 | .17 | .48 | .30 | 0 | .57 |
| 45 | 98.3 | .16 | .10 | .02 | .20 | .01 | .41 | .09 | .20 | .11 | -.20 | .07 | 0 | .10 | .10 | .11 | .20 | .15 | .20 | .39 |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF
B = TAN OF LOSS ANG. ; Unit: X 10 - 3

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111b/A/2

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: U.S. TESTING CO. INC. Country: U.S.A.

Type of Component: CERAMIC CAPACITORS (PHENOLIC COATING) ~~Capacitance, Tangent of loss angle, Insulation Resistance~~ Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/7/56 | | date: 5/10/56 | | date: 5/14/56 | | date: 5/21/56 | | date: 5/28/56 | | date: 6/4/56 | | date: 6/18/56 | | date: 7/2/56 | | date: 7/16/56 | | date: 7/30/56 | |
| | T: 22°C RH: 52 % | | T: 22°C RH: 45% | | T: 22°C RH: 48 % | | T: 21°C RH: 47 % | | T: 23 °C RH: 46% | | T: 22 °C RH: 52 % | | T: 22 °C RH: 56 % | | T: 22 °C RH: 60% | | T: 22 °C RH: 56% | | T: 24 °C RH: 55% | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 31 | 400 | | 50 | | -37.5 | | -80.0 | | -86.2 | | -88.3 | | -88.3 | | -95.8 | | -99.2 | | -99.5 | |
| 32 | 500 | | 0 | | -40.0 | | -62.0 | | -80.0 | | -84.0 | | -82.0 | | -87.6 | | -99.3 | | -99.0 | |
| 33 | 500 | | 0 | | -50.0 | | -78.0 | | -84.0 | | -86.0 | | -86.6 | | -91.6 | | -97.4 | | -98.9 | |
| 34 | 400 | | 0 | | -25.0 | | -70.0 | | -83.8 | | -84.8 | | -83.0 | | -86.3 | | -91.3 | | -97.8 | |
| 35 | 300 | | 33.3 | | 33.3 | | -16.6 | | -36.6 | | -50.0 | | -66.6 | | -73.3 | | -84.7 | | -95.8 | |
| 36 | 400 | | 25.0 | | -25.0 | | -50.0 | | -57.5 | | -75.0 | | -76.2 | | -80.5 | | -99.8 | | -99.9 | |
| 37 | 500 | | -20.0 | | -87.2 | | -93.4 | | -93.8 | | -93.6 | | -93.6 | | -96.4 | | -99.8 | | -99.9 | |
| 38 | 500 | | -20.0 | | 0 | | -20.0 | | -40.0 | | -40.0 | | -60.0 | | -93.0 | | -92.4 | | -97.9 | |
| 39 | 300 | | 66.6 | | -16.6 | | -68.3 | | -81.6 | | -82.7 | | -83.7 | | -87.0 | | -99.0 | | -99.4 | |
| 40 | 400 | | -25.0 | | -55.0 | | -89.0 | | -92.5 | | -95.0 | | -91.0 | | -94.3 | | -99.5 | | -99.9 | |
| 41 | 500 | | 0 | | -20.0 | | -40.0 | | -60.0 | | -68.0 | | -64.0 | | -86.6 | | -99.4 | | -99.6 | |
| 42 | 500 | | -20.0 | | -60.0 | | -80.0 | | -87.0 | | -91.2 | | -89.0 | | -92.0 | | -96.0 | | -99.2 | |
| 43 | 300 | | 33.3 | | 0 | | -16.6 | | -40.0 | | -66.6 | | -68.0 | | -66.6 | | -67.6 | | -70.0 | |
| 44 | 500 | | -20.0 | | -50.0 | | -68.0 | | -83.2 | | -88.2 | | -89.4 | | -99.3 | | -99.9 | | -99.9 | |
| 45 | 500 | | 0 | | -20.0 | | -40.0 | | -62.0 | | -78.0 | | -80.0 | | -86.4 | | -99.0 | | -98.9 | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INSULATION RESISTANCE ; Unit: MEGOHMS X $10^3$
B = ; Unit:

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111c/A/1

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (WAX DIPPED) Capacitance + Tangent of Loss Angle; ~~Insulation Resistance~~ *

| | Initial meas. | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/7/56 | | date: 5/10/56 | | date: 5/14/56 | | date: 5/21/56 | | date: 5/28/56 | | date: 6/4/56 | | date: 6/18/56 | | date: 7/2/56 | | date: 7/16/56 | | date: 7/30/56 | |
| | T: 22°C RH: 52 % | | T: 25 °C RH: 59% | | T: 25°C RH: 67 % | | T: 28°C RH: 46 % | | T: 22°C RH: 65 % | | T: 26°C RH: 71 % | | T: 24 °C RH: 70% | | T: 22 °C RH: 60 % | | T: 22 °C RH: 56% | | T: 24°C RH: 55 % | |
| | A | B | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % |
| 31 | 52.04 | 5.50 | .17 | 2.18 | .69 | -3.27 | .42 | 14.18 | .90 | 54.54 | 2.77 | 189.09 | 10.8 | 838.18 | REMOVED FROM TEST | | | | | |
| 32 | 49.61 | 5.42 | .08 | 6.09 | .14 | -.55 | .20 | 9.59 | .28 | 20.00 | .62 | 22.32 | 4.45 | 344.64 | REMOVED FROM TEST | | | | | |
| 33 | 51.02 | 5.10 | .14 | 2.16 | .12 | 0 | .25 | 9.41 | .49 | 17.65 | 1.27 | 58.23 | 4.82 | 303.92 | REMOVED FROM TEST | | | | | |
| 34 | 50.78 | 5.10 | .16 | 2.55 | .16 | .39 | .20 | 6.27 | .16 | 8.23 | .24 | .78 | .28 | 5.68 | .51 | 4.90 | .78 | 25.88 | 3.89 | 268.62 |
| 35 | 50.68 | 5.40 | .20 | 3.70 | .28 | -1.85 | .39 | 13.70 | .35 | 28.52 | 2.01 | 129.63 | 19.69 | 1997.22 | REMOVED FROM TEST | | | | | |
| 36 | 49.19 | 5.22 | .20 | 3.64 | .28 | .77 | .61 | 25.86 | 2.27 | 166.28 | 14.47 | 2829.1 | 201.68 | REMOVED FROM TEST - SHORTED | | | | | | |
| 37 | 49.34 | 5.30 | .59 | 2.45 | .59 | -.94 | .67 | 6.22 | .69 | 8.68 | .83 | 4.91 | 1.23 | 35.84 | 3.650 | 194.33 | REMOVED FROM TEST | | | |
| 38 | 49.85 | 5.35 | .26 | 1.49 | .28 | -2.43 | .33 | 6.54 | .38 | 16.82 | 1.30 | 81.31 | 12.03 | 154.95 | REMOVED FROM TEST | | | | | |
| 39 | 47.23 | 5.30 | .42 | 6.04 | .72 | 5.85 | 1.46 | 82.45 | 15.09 | 1013.2 | 371.52 | 6145.2 | | REMOVED FROM TEST - SHORTED | | | | | | |
| 40 | 51.06 | 5.50 | .14 | 2.00 | .08 | -2.55 | .14 | 9.09 | .12 | 7.27 | .19 | .36 | .29 | 5.27 | .74 | 16.36 | 2.03 | 98.05 | RFT | |
| 41 | 51.00 | 5.15 | .16 | 1.36 | .20 | -.97 | .24 | 13.79 | .43 | 16.50 | .78 | 51.46 | 2.47 | 144.66 | REMOVED FROM TEST | | | | | |
| 42 | 49.12 | 5.21 | .37 | 0.77 | .43 | -1.73 | .61 | 6.52 | .79 | 14.01 | 1.20 | 19.38 | 3.01 | 107.29 | REMOVED FROM TEST | | | | | |
| 43 | 49.63 | 5.15 | .40 | 3.88 | .46 | .39 | .56 | 8.35 | .62 | 15.14 | .89 | 19.22 | 1.75 | 148.54 | REMOVED FROM TEST | | | | | |
| 44 | 47.30 | 5.00 | -.13 | 4.00 | -.04 | 2.00 | .15 | 4.60 | .36 | 22.40 | .72 | 58.00 | 2.26 | 190.00 | REMOVED FROM TEST | | | | | |
| 45 | 49.43 | 4.80 | .28 | 3.33 | .22 | 2.08 | .57 | 22.91 | 1.19 | 76.04 | 2.57 | 70.83 | 8.25 | 702.08 | REMOVED FROM TEST | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF X $10^3$
B = TAN LOSS ANGLE ; Unit: X 10 - 3

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111c/A/2

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (WAX DIPPED) ~~Capacitance and Tangent of Loss Angle~~ Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/7/56 | | date: 5/10/56 | | date: 5/14/56 | | date: 5/21/56 | | date: 5/28/56 | | date: 6/4/56 | | date: 6/18/56 | | date: 7/2/56 | | date: 7/16/56 | | date: 7/30/56 | |
| | T: 22 °C RH: 52% | | T: 25 °C RH: 59% | | T 25 °C RH 67% | | T 26 C RH 46 % | | T 22 °C RH: 65% | | T 26 °C RH: 71% | | T: 24 °C RH: 70% | | T: 22 °C RH: 60% | | T 22 °C RH: 56% | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 31 | 43 | | -27.9 | | -86.0 | | -99.8 | | -99.9 | | -99.9 | | REMOVED FROM TEST - BELOW 10 MEGOHMS | | | | | | | |
| 32 | 52 | | -55.7 | | -42.3 | | -36.5 | | -96.9 | | -99.9 | | REMOVED FROM TEST - BELOW 10 MEGOHMS | | | | | | | |
| 33 | 42 | | -11.9 | | -16.7 | | -96.2 | | -99.7 | | -99.9 | | REMOVED FROM TEST - BELOW 10 MEGOHMS | | | | | | | |
| 34 | 65 | | -66.1 | | -23.1 | | -40.0 | | -46.1 | | -55.4 | | -93.8 | | -99.0 | | -99.9 | | -99.9 | |
| 35 | 60 | | -38.3 | | -90.8 | | -99.9 | | -99.9 | | -99.9 | | REMOVED FROM TEST - BELOW 10 MEGOHMS | | | | | | | |
| 36 | 39 | | -48.7 | | -99.8 | | -99.9 | | -99.9 | | -99.9 | | REMOVED FROM TEST - BELOW 10 MEGOHMS | | | | | | | |
| 37 | 63 | | -20.6 | | -44.4 | | -36.5 | | -99.9 | | -99.6 | | -93.7 | | -99.9 | | REMOVED FROM TEST | | | |
| 38 | 49 | | ∤ 6.1 | | -14.3 | | -38.8 | | -99.8 | | -99.9 | | REMOVED FROM TEST - SHORTED | | | | | | | |
| 39 | 34 | | -99.7 | | -99.9 | | -99.9 | | -99.9 | | -55.9 | | REMOVED FROM TEST - BELOW 10 MEGOHMS | | | | | | | |
| 40 | 65 | | -52.3 | | -49.2 | | -47.7 | | -04.6 | | -97.7 | | -99.7 | | -99.9 | | -99.9 | | RFT | |
| 41 | 61 | | -50.8 | | -84.4 | | -99.8 | | -99.9 | | -99.9 | | REMOVED FROM TEST - BELOW 10 MEGOHMS | | | | | | | |
| 42 | 58 | | -39.6 | | -36.2 | | -95.2 | | -99.2 | | -99.5 | | REMOVED FROM TEST - BELOW 10 MEGOHMS | | | | | | | |
| 43 | 55 | | -45.4 | | -41.8 | | -87.3 | | -99.7 | | -99.9 | | REMOVED FROM TEST - BELOW 10 MEGOHMS | | | | | | | |
| 44 | 37 | | -30.7 | | -24.3 | | -94.3 | | -99.8 | | -99.9 | | REMOVED FROM TEST - BELOW 10 MEGOHMS | | | | | | | |
| 45 | 50 | | -20.0 | | -84.0 | | -99.9 | | -99.9 | | -99.9 | | REMOVED FROM TEST - BELOW 10 MEGOHMS | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INSULATION ; Unit: MEGOHMS X $10^3$
B = RESISTANCE ; Unit:

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111d/A/1

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: RESISTORS (CRACKED CARBON, LAQUER COATED) ~~Capacitance; Dissipation factor; Angle; Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas. | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/4/56 | | date: 5/7/56 | | date: 5/11/56 | | date: 5/18/56 | | date: 5/25/56 | | date: 6/1/56 | | date: 6/15/56 | | date: 6/29/56 | | date: 7/13/56 | | date: 7/27/56 | |
| | T: 23 °C RH 61 % | | T: 26 °C RH: 56 % | | T: 22 °C RH 56 % | | T: 24 °C RH: 51 % | | T: 23 °C RH 46 % | | T: 29 °C RH: [illegible] % | | T: 26 °C RH: 49 % | | T: 24 °C RH: 62 % | | T: 26 °C RH: 56 % | | T: 21 °C RH: 76 % | |
| | A | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | % | B | A % | B |
| 31 | 502590 | | 1.8 | | 2.2 | | 3.1 | | 3.2 | | 3.8 | | 4.9 | | 5.6 | | 5.9 | | 6.6 | |
| 32 | 475390 | | 0.5 | | 0.8 | | 1.0 | | 1.2 | | 1.3 | | 1.6 | | 2.1 | | 2.0 | | 2.4 | |
| 33 | 474920 | | 2 | | 3.2 | | 4.4 | | 5.0 | | 5.9 | | 7.0 | | 8.3 | | 8.8 | | 9.8 | |
| 34 | 475890 | | .8 | | 0.8 | | 0.9 | | 1.0 | | 0.8 | | 0.9 | | 1.1 | | 1.0 | | 1.3 | |
| 35 | 486190 | | 1.5 | | 2 | | 2.7 | | 3.0 | | 3.9 | | 4.6 | | 5.3 | | 5.6 | | 6.2 | |
| 36 | 490800 | | 1.3 | | 1.8 | | 2.1 | | 2.4 | | 2.4 | | 2.8 | | 3.2 | | 3.1 | | 3.5 | |
| 37 | 476660 | | 0.7 | | 1.0 | | 1.4 | | 1.8 | | 1.9 | | 2.5 | | 2.8 | | 3.2 | | 3.6 | |
| 38 | 459480 | | 1.0 | | 1.9 | | 2.6 | | 4 | | 4.7 | | 5.3 | | 6.1 | | 6.1 | | 6.6 | |
| 39 | 479270 | | 1.9 | | 2.7 | | 3.8 | | 4.8 | | 5.9 | | 7.7 | | 9.0 | | 10.1 | | 10.9 | |
| 40 | 496090 | | 1.1 | | 1.4 | | 2.0 | | 2.3 | | 2.2 | | 2.5 | | 2.9 | | 2.7 | | 3.1 | |
| 41 | 491530 | | 1.7 | | 2.8 | | 3.8 | | 4.5 | | 4.7 | | 5.4 | | 5.6 | | 6.2 | | 6.8 | |
| 42 | 455640 | | 1.3 | | 1.9 | | 3.0 | | 3.7 | | 3.7 | | 3.9 | | 4.3 | | 4.2 | | 4.5 | |
| 43 | 482590 | | 1.4 | | 2.4 | | 3.9 | | 5.1 | | 6.0 | | 7.0 | | 7.5 | | 8.3 | | 8.6 | |
| 44 | 495690 | | 3.7 | | 8.0 | | Opened | | - | | - | | - | | - | | - | | - | |
| 45 | 500360 | | 1.1 | | 1.3 | | 1.4 | | 1.6 | | 1.4 | | 1.7 | | 1.9 | | 1.9 | | 2.0 | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = RESISTANCE ; Unit: OHMS
B = ; Unit:

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 1a/C/1

## TEST REPORT
Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (METAL WITH GLASS) Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/29/56 | | date: 6/5/56 | | date: 6/12/56 | | date: 6/19/56 | | date: 6/26/56 | | date: 7/10/56 | | date: 7/24/56 | | date: 8/7/56 | | date: 8/21/56 | | date: | |
| | T: 25°C RH: 56% | | T: 26 °C RH: 46% | | T: 27°C RH: 54% | | T: 28°C RH: 55 % | | T: 28°C RH: 58% | | T: 27 °C RH: 61% | | T: 23 °C RH: 65% | | T: 27°C RH: 68 % | | T: 22°C RH: 69 % | | T: °C RH: % | |
| | A | B | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A | B |
| 46 | 48.57 | 3.36 | .24 | -1.78 | .31 | -2.38 | .21 | -.59 | .25 | .59 | .31 | -4.46 | .33 | -5.36 | .23 | -1.19 | .19 | - .30 | | |
| 47 | 44.59 | 3.90 | .31 | -2.56 | .40 | -2.56 | .22 | -.26 | .27 | 0 | .38 | -5.13 | .51 | -7.18 | .22 | - .51 | .22 | -1.79 | | |
| 48 | 42.61 | 4.25 | .37 | -3.29 | .47 | -3.52 | .31 | -1.18 | .18 | -2.82 | .47 | -7.06 | .47 | -7.06 | .33 | -3.29 | .31 | -3.30 | | |
| 49 | 48.57 | 3.40 | .23 | -1.47 | .26 | .59 | .14 | 2.94 | .20 | 1.47 | .27 | -1.20 | .35 | -5.29 | .21 | - .29 | .19 | 1.76 | | |
| 50 | 45.87 | 3.67 | .28 | -1.63 | .30 | .27 | .22 | .54 | .26 | .54 | .35 | -3.27 | .39 | -4.36 | .24 | - .54 | .22 | -1.09 | | |
| 51 | 43.53 | 4.30 | .36 | -3.25 | .48 | -2.10 | .28 | -20.46 | .34 | -.23 | .44 | -4.65 | .50 | -6.98 | .30 | -2.09 | .28 | - .47 | | |
| 52 | 50.43 | 3.25 | .26 | -2.15 | .31 | -2.76 | .18 | .31 | .26 | -.61 | .30 | -4.00 | .34 | -5.54 | .22 | -1.54 | .22 | -1.54 | | |
| 53 | 47.97 | 3.60 | .27 | -2.22 | .31 | -.83 | .21 | -1.38 | .25 | 2.50 | .35 | -4.17 | .39 | -5.28 | .25 | -2.50 | .19 | -1.39 | | |
| 54 | 44.08 | 3.89 | .34 | -2.31 | .45 | -3.08 | .25 | .77 | .44 | -4.63 | .43 | -3.08 | .43 | -4.63 | .32 | -2.05 | .27 | -1.03 | | |
| 55 | 49.82 | 3.28 | .26 | -3.04 | .32 | -2.74 | .18 | .61 | .24 | -2.13 | .32 | -6.40 | .38 | -7.01 | .22 | -2.44 | .22 | -2.44 | | |
| 56 | 48.41 | 3.31 | .25 | -1.51 | .31 | -.90 | .18 | -.30 | .25 | .30 | .31 | -1.81 | .35 | -4.83 | .23 | - .30 | .21 | - .91 | | |
| 57 | 48.71 | 3.31 | .20 | -1.51 | .31 | -2.71 | .14 | 2.72 | .18 | 1.21 | .25 | -2.42 | .31 | -3.32 | .18 | 0 | .16 | 0 | | |
| 58 | 48.86 | 3.45 | .24 | -3.76 | .28 | -1.44 | .20 | .58 | .24 | -1.45 | .27 | -3.48 | .37 | -6.66 | .22 | -3.19 | .20 | -1.74 | | |
| 59 | 43.99 | 3.72 | .36 | -2.41 | .50 | -1.34 | .34 | -.27 | .39 | 1.61 | .43 | -1.88 | .52 | -5.91 | .34 | 1.88 | .32 | -2.15 | | |
| 60 | 48.76 | 3.43 | .26 | -2.62 | .33 | -1.45 | .20 | 0 | .27 | -1.17 | .33 | -4.37 | .37 | -4.37 | .25 | - .58 | .21 | - .87 | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF X $10^3$
B = TAN OF LOSS ANG. ; Unit: X 10-3

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 1a/C/2

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO, INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (METAL WITH GLASS) ~~Capacitance / Tangent of Loss Angle/ Resistance~~ Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/29/56 | | date: 6/5/56 | | date: 6/12/56 | | date: 6/26/56 | | date: 6/26/56 | | date: 7/10/56 | | date: 7/24/56 | | date: 8/7/56 | | date: 8/21/56 | | date: | |
| | T: 25°C RH: 56% | | T: 25°C RH: 46% | | T: 27°C RH: 54% | | T: 21°C RH: 55% | | T: 23°C RH: 58% | | T: 27°C RH: 61% | | T: 23°C RH: 65% | | T: 27°C RH: 68% | | T: 22°C RH: 69% | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 46 | 180 | 500 | 80 | 500 | 150 | 600 | 69 | 750 | 120 | 600 | 100 | 400 | 200 | 700 | 180 | 500 | 200 | 400 | | |
| 47 | 300 | 500 | 60 | 600 | 100 | 500 | 90 | 800 | 90 | 85 | 100 | 600 | 180 | 600 | 180 | 400 | 200 | 500 | | |
| 48 | 160 | 900 | 50 | 300 | 70 | 400 | 65 | 90 | 96 | 43 | 80 | 55 | 100 | 500 | 140 | 400 | 190 | 400 | | |
| 49 | 84 | *1000 | 95 | 400 | 200 | 400 | 180 | 500 | 100 | 500 | 110 | 500 | 140 | 400 | 110 | 500 | 100 | 600 | | |
| 50 | 55 | 700 | 120 | 400 | 120 | 350 | 90 | 700 | 90 | 350 | 200 | 500 | 190 | 500 | 250 | 400 | 250 | 180 | | |
| 51 | 120 | 900 | 100 | 450 | 90 | 400 | 100 | 600 | 90 | 900 | 200 | 600 | 160 | 500 | 180 | 400 | 180 | 500 | | |
| 52 | 70 | 1000 | 90 | 400 | 80 | 400 | 75 | 500 | 200 | 500 | 190 | 400 | 190 | 400 | 250 | 400 | 200 | 300 | | |
| 53 | 80 | 700 | 60 | 300 | 200 | 500 | 180 | 400 | 200 | 400 | 160 | 400 | 160 | 600 | 120 | 600 | 300 | 600 | | |
| 54 | 300 | *1000 | 45 | 500 | 150 | 500 | 85 | 500 | 85 | 500 | 100 | 200 | 190 | 500 | 250 | 500 | 250 | 500 | | |
| 55 | 180 | *1000 | 140 | 500 | 110 | 500 | 90 | 190 | 100 | 600 | 100 | 600 | 150 | 600 | 150 | 600 | 150 | 600 | | |
| 56 | 50 | 500 | 160 | 600 | 190 | 500 | 110 | 800 | 180 | 600 | 190 | 400 | 200 | 600 | 200 | 500 | 200 | 500 | | |
| 57 | *1000 | *1000 | 120 | 400 | 30 | 400 | 190 | 700 | 55 | 1000 | 55 | 500 | 150 | 400 | 150 | 150 | 180 | 21 | | |
| 58 | 90 | *1000 | 200 | 300 | 95 | 500 | 60 | 600 | 140 | 600 | 180 | 500 | 180 | 500 | 180 | 500 | 140 | 180 | | |
| 59 | 140 | *1000 | 200 | 500 | 120 | 500 | 70 | 600 | 60 | 600 | 75 | 500 | 200 | 500 | 190 | 500 | 200 | 500 | | |
| 60 | 30 | 600 | 70 | 400 | 68 | 500 | 68 | 600 | 60 | 600 | 95 | 600 | 120 | 600 | 130 | 500 | 150 | 300 | | |

* Delete if not applicable.

T = ambient temperature in laboratory,
RH= relative humidity in laboratory.

A = INS. RESISTANCE ; Unit: MEGOHMS X $10^3$ TERM. TO TERM.
B = INS. RESISTANCE ; Unit: MEGOHMS X $10^3$ TERMS. TO CASE

* Greater than 1000

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 1b/C/1

## TEST REPORT
Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (METAL WITH NEOPRENE) Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/29/56 | | date: 6/5/56 | | date: 6/12/56 | | date: 6/19/56 | | date: 6/26/56 | | date: 7/10/56 | | date: 7/24/56 | | date: 8/7/56 | | date: 8/21/56 | | date: | |
| | T: 25°C RH: 56 % | | T: 27°C RH: 46 % | | T: 27°C RH: 54 % | | T: 27°C RH: 55 % | | T: 23°C RH: 58 % | | T: 27°C RH: 61 % | | T: 23°C RH: 65 % | | T: 27°C RH: 68 % | | T: 22°C RH: 69 % | | T: °C RH: % | |
| | A | B | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A | B |
| 46 | 42.46 | 4.05 | .20 | -3.70 | .42 | -2.71 | .14 | -5.18 | .16 | -2.47 | .08 | -5.18 | 0 | -7.41 | .20 | -2.47 | .10 | -2.22 | | |
| 47 | 42.53 | 3.74 | .16 | -3.20 | .35 | -2.94 | .07 | -5.10 | .12 | -1.87 | -.02 | -5.35 | -.12 | -6.68 | .07 | 1.07 | -.02 | -3.21 | | |
| 48 | 56.85 | 3.73 | .15 | -2.94 | .38 | -1.87 | .11 | -3.48 | .11 | -2.95 | .09 | -3.75 | .02 | -5.63 | .14 | - .80 | .16 | - .80 | | |
| 49 | 45.99 | 3.64 | .15 | -3.38 | .21 | -3.64 | -.02 | -4.43 | 0 | -3.64 | -.04 | -5.47 | -.11 | -6.25 | -.06 | -2.86 | -.13 | -4.17 | | |
| 50 | 58.17 | 4.22 | .17 | -4.26 | .32 | -2.84 | .12 | -5.21 | .12 | -2.61 | .10 | -5.45 | .08 | -6.40 | .10 | - .95 | .05 | -2.84 | | |
| 51 | 47.41 | 3.89 | .14 | -4.37 | .33 | -2.82 | .06 | -4.88 | .06 | -2.31 | -.04 | -5.65 | -.17 | -7.20 | -.06 | 2.06 | -.17 | -3.60 | | |
| 52 | 49.64 | 3.25 | .04 | -4.61 | .46 | -2.46 | .12 | -3.08 | .08 | -2.15 | -.10 | -5.23 | -.28 | -6.15 | 0 | -1.85 | -.04 | -2.77 | | |
| 53 | 45.09 | 3.86 | .22 | -4.14 | .42 | - .77 | .24 | -2.85 | .18 | -2.59 | .02 | -6.22 | -.13 | -7.00 | .15 | -2.85 | .07 | -4.14 | | |
| 54 | 56.65 | 4.77 | .22 | -2.72 | .38 | -3.35 | .25 | -1.47 | .23 | .21 | .17 | -4.19 | .12 | -6.71 | .16 | .63 | .11 | -1.26 | | |
| 55 | 46.54 | 3.81 | .12 | -2.88 | .36 | .52 | .13 | - .52 | .21 | -2.36 | -.04 | -4.46 | -.11 | -5.51 | 0 | -1.57 | -.13 | -2.62 | | |
| 56 | 45.31 | 3.76 | .24 | -2.12 | .46 | -1.59 | .26 | - .26 | .20 | -1.06 | .09 | -3.99 | 0 | -1.86 | .07 | - .80 | .07 | - .53 | | |
| 57 | 53.66 | 3.90 | .16 | -3.58 | .48 | -2.56 | .24 | -2.56 | .26 | -1.79 | .15 | -5.13 | .05 | -7.18 | .26 | .26 | .15 | -2.31 | | |
| 58 | 52.08 | 3.85 | .17 | -1.55 | .40 | -3.89 | .23 | -1.29 | .19 | -1.30 | .11 | -4.93 | .08 | -6.50 | .15 | -2.86 | .08 | -2.86 | | |
| 59 | 46.48 | 3.90 | .12 | -4.61 | .32 | -3.84 | .13 | -2.05 | .09 | -2.56 | -.02 | -5.83 | -.09 | -7.43 | 0 | -2.05 | -.09 | -3.33 | | |
| 60 | 43.75 | 3.80 | .16 | -4.21 | .38 | -2.89 | .14 | -3.94 | .11 | -3.42 | -.02 | -6.58 | -.14 | -8.16 | -.04 | -4.74 | -.09 | -4.47 | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF X $10^3$
B = TAN OF LOSS ANG. ; Unit: X $10^{-3}$

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 1b/C/2

# TEST REPORT
Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (METAL WITH NEOPRENE) ~~Capacitance, Tangent of Loss Angle, Resistance~~; Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/29/56 | | date: 6/5/56 | | date: 6/12/56 | | date: 6/19/56 | | date: 6/26/56 | | date: 7/10/56 | | date: 7/24/56 | | date: 8/7/56 | | date: 8/21/56 | | date: | |
| | T: 25°C RH: 86 % | | T: 27°C RH: 46% | | T: 27°C RH: 54 % | | T: 21°C RH: 55 % | | T: 23°C RH: 58% | | T: 27°C RH: 61% | | T: 23°C RH: 65 % | | T: 27 °C RH: 68% | | T: 22 °C RH: 69% | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 46 | 57 | *1000 | 35 | 500 | 33 | 600 | 28 | 800 | 29 | 500 | 28 | 400 | 44 | 500 | 32 | 400 | 28 | 400 | | |
| 47 | 52 | *1000 | 29 | 700 | 34 | 700 | 29.5 | 800 | 34 | 500 | 28 | 500 | 28 | 800 | 27 | 500 | 25 | 85 | | |
| 48 | 78 | 1000 | 62 | 600 | 37 | 500 | 25.5 | 900 | 31 | 600 | 30 | 500 | 39 | 500 | 35 | 500 | 39 | 400 | | |
| 49 | 60 | 1000 | 80 | 500 | 52 | 500 | 80 | 800 | 55 | 800 | 50 | 500 | 47 | 600 | 34 | 400 | 28 | 500 | | |
| 50 | 40 | *1000 | 32 | 450 | 30 | 900 | 24 | 600 | 30 | 400 | 27 | 350 | 30 | 400 | 22 | 400 | 18 | 400 | | |
| 51 | 74 | *1000 | 33 | 500 | 34 | 500 | 25 | 500 | 31 | 300 | 33 | 350 | 33 | 500 | 35 | 500 | 30 | 500 | | |
| 52 | 83 | 1000 | 47 | 600 | 51 | 200 | 40 | 1000 | 38 | 600 | 36 | 500 | 44 | 500 | 30 | 500 | 27 | 500 | | |
| 53 | 52 | 700 | 45 | 500 | 36 | 700 | 37 | 900 | 35 | 700 | 33 | 500 | 34 | 600 | 25 | 600 | 19 | 500 | | |
| 54 | 41 | 900 | 32 | 600 | 32 | 600 | 43 | 600 | 29 | 400 | 20 | 300 | 33 | 500 | 21 | 400 | 22 | 300 | | |
| 55 | 44 | 1000 | 48 | 700 | 31 | 700 | 36 | 1000 | 29 | 500 | 25 | 400 | 41 | 400 | 33 | 500 | 28 | 500 | | |
| 56 | 67 | *1000 | 50 | 500 | 45 | 500 | 59 | 500 | 55 | 400 | 37 | 500 | 37 | 500 | 35 | 500 | 33 | 400 | | |
| 57 | 50 | *1000 | 21 | 500 | 26 | 600 | 26 | 1000 | 21 | 700 | 13 | 400 | 16 | 300 | 6.6 | 500 | 5 | 400 | | |
| 58 | 44 | *1000 | 29 | 600 | 35 | 500 | 32 | 600 | 29 | 400 | 26 | 400 | 25 | 600 | 17 | 500 | 12 | 400 | | |
| 59 | 55 | *1000 | 55 | 700 | 37 | 600 | 30 | 600 | 33 | 400 | 27 | 500 | 40 | 400 | 26 | 400 | 23 | 300 | | |
| 60 | 65 | *1000 | 34 | 500 | 34 | 600 | 35 | 1000 | 31 | 600 | 28 | 400 | 44 | 600 | 21 | 500 | 13 | 300 | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INS. RESISTANCE ; Unit: MEGOHMS X $10^3$ TERM. TO TERM.
B = INS. RESISTANCE ; Unit: MEGOHMS X $10^3$ TERMS. TO CASE

• Greater than 1000

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 11/C/1

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING COMPANY, INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (PHENOLIC MOULDING) Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/31/56 | | date: 6/7/56 | | date: 6/14/56 | | date: 6/21/56 | | date: 6/28/56 | | date: 7/12/56 | | date: 7/26/56 | | date: 8/9/56 | | date: 8/23/56 | | date: | |
| | T: 28°C RH: 65 % | | T: 28 °C RH: 48 % | | T: 31 °C RH: 67 % | | T: 22°C RH: 60 % | | T: 27°C RH: 55 % | | T: 30 °C RH: 50 % | | T: 31 °C RH: 57 % | | T: 28 °C RH: 62 % | | T: 25°C RH: 71 % | | T: °C RH: % | |
| | A | B | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A % | B % | A | B |
| 46 | 6.442 | 3.20 | .09 | -1.25 | .15 | -6.25 | -.08 | 0 | -.06 | -2.19 | -.09 | -2.81 | -.26 | 2.50 | -.32 | -.62 | -.51 | 7.81 | | |
| 47 | 6.583 | 3.24 | .10 | .61 | .10 | -3.39 | -.04 | 2.16 | -.01 | - .92 | -.08 | .92 | -.15 | 1.23 | -.20 | 1.23 | -.36 | 8.33 | | |
| 48 | 7.626 | 4.00 | .06 | .75 | .14 | -4.50 | -.10 | 1.25 | -.11 | - .75 | -.22 | 1.50 | -.20 | 1.25 | -.20 | 1.25 | -.34 | 9.00 | | |
| 49 | 7.490 | 3.91 | .18 | 1.02 | .36 | -4.85 | .14 | 1.53 | .31 | -1.53 | .27 | 0 | .28 | 0 | .29 | 2.05 | .17 | 5.37 | | |
| 50 | 2.281 | 3.98 | .28 | -1.00 | .48 | -7.03 | .22 | 0 | .34 | -3.01 | .42 | -3.52 | .34 | -4.52 | .37 | 2.01 | .15 | 6.03 | | |
| 51 | 6.971 | 3.50 | .60 | 48.57 | 1.96 | 331.42 | 2.81 | 60.71 | REMOVED FROM TEST - INSULATION RESISTANCE BELOW 10 MEGOHMS | | | | | | | | | | | |
| 52 | 6.431 | 3.15 | .03 | 2.22 | .14 | -4.76 | -.08 | 2.54 | 0 | - .95 | -.06 | - .95 | -.12 | -.95 | -.22 | .95 | -.39 | 8.25 | | |
| 53 | 7.446 | 4.49 | 0 | 3.56 | .55 | 9.35 | .38 | 12.47 | .72 | 33.63 | .75 | 40.75 | .93 | 55.68 | .95 | 58.35 | .85 | 58.35 | | |
| 54 | 7.309 | 3.81 | .20 | .78 | .38 | -4.46 | .19 | 1.57 | .27 | - .26 | .33 | - .26 | .30 | 0 | .31 | -.26 | .16 | 6.30 | | |
| 55 | 6.599 | 3.24 | .07 | 1.85 | .18 | -4.62 | -.01 | 1.85 | .01 | - .31 | -.01 | -1.23 | -.12 | .31 | -.12 | -.31 | -.30 | 5.86 | | |
| 56 | 6.900 | 3.20 | .09 | .31 | .11 | -4.37 | -.06 | 2.81 | -.01 | - .62 | -.06 | - .31 | -.10 | - .94 | -.14 | -1.56 | -.38 | 7.50 | | |
| 57 | 7.073 | 3.85 | .23 | 0 | .42 | -5.97 | .21 | .26 | .32 | -2.59 | .30 | - .78 | .30 | -1.04 | .35 | -1.82 | .23 | 6.49 | | |
| 58 | 7.390 | 3.80 | .18 | 0 | .37 | -2.89 | .22 | -.53 | .26 | -2.63 | .30 | -2.63 | .22 | -.79 | .22 | -2.37 | .08 | 3.95 | | |
| 59 | 6.633 | 3.10 | .07 | .32 | .09 | -4.84 | -.07 | .32 | -.07 | - .97 | -.16 | .64 | -.19 | -1.29 | -.29 | .32 | -.42 | 6.13 | | |
| 60 | 6.903 | 3.20 | .09 | .31 | .15 | -5.31 | -.01 | 1.56 | .01 | - .94 | -.01 | -1.56 | -.14 | .94 | -.16 | -1.56 | -.33 | 8.13 | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF X $10^{-3}$
B = TAN OF LOSS ANG. ; Unit: X $10^{-3}$

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 11/C/2

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (PHENOLIC MOULDING) ~~Capacitance - Tangent of Loss Angle - Electronic~~ Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/31/56 | | date: 6/7/56 | | date: 6/14/56 | | date: 6/21/56 | | date: 6/28/56 | | date: 7/12/56 | | date: 6/26/56 | | date: 8/9/56 | | date: 8/23/56 | | date: | |
| | T: 28 °C RH: 65 % | | T: 28 °C RH: 48 % | | T: 31 °C RH: 67 % | | T: 22 °C RH: 60 % | | T: 27 °C RH: 55 % | | T: 30 °C RH: 50 % | | T: 31 °C RH: 5 % | | T: 28 °C RH: 62 % | | T: 25 °C RH: 71 % | | T: °C RH: % | |
| | A | B | A g | B | A g | B | A g | B | A g | B | A g | B | A g | B | A g | B | A g | B | A | B |
| 46 | 500 | | -91.40 | | -99.22 | | -97.80 | | -99.26 | | -99.36 | | -99.46 | | -99.71 | | -99.81 | | | |
| 47 | 300 | | -76.66 | | -97.83 | | -95.00 | | -97.87 | | -99.66 | | -97.00 | | -99.00 | | -99.20 | | | |
| 48 | 200 | | -83.00 | | -97.20 | | -94.50 | | -96.60 | | -96.50 | | -98.00 | | -99.30 | | -99.05 | | | |
| 49 | 250 | | -36.00 | | -61.20 | | -56.00 | | -52.00 | | -56.00 | | -60.00 | | -60.00 | | -60.00 | | | |
| 50 | 2`0 | | -10.00 | | -45.00 | | -10.00 | | -25.00 | | - 5.00 | | -15.00 | | -40.00 | | -40.00 | | | |
| 51 | 3.7 | | -97.56 | | -99.73 | | -99.81 | | REMOVED FROM TEST - INSULATION RESISTANCE BELOW 10 MEGOHMS | | | | | | | | | | | |
| 52 | 900 | | -96.11 | | -99.47 | | -98.97 | | -99.55 | | -99.51 | | -99.69 | | -99.85 | | -99.81 | | | |
| 53 | .35 | | -37.14 | | -72.57 | | -52.86 | | -82.85 | | -86.57 | | -82.86 | | -89.43 | | -87.14 | | | |
| 54 | 250 | | -20.00 | | -52.00 | | -20.00 | | -24.00 | | -40.00 | | -24.00 | | -40.00 | | -20.00 | | | |
| 55 | 300 | | -83.66 | | -98.33 | | -95.66 | | -98.00 | | -98.50 | | -99.23 | | -99.60 | | -99.62 | | | |
| 56 | 300 | | -85.00 | | -98.43 | | -96.25 | | -98.47 | | -97.26 | | -98.53 | | -99.33 | | -99.47 | | | |
| 57 | 300 | | -33.33 | | -56.66 | | -33.33 | | -43.33 | | -40.00 | | -36.66 | | -43.33 | | -33.33 | | | |
| 58 | 250 | | 0 | | -20.00 | | -72.00 | | -56.00 | | -60.00 | | -28.00 | | -20.00 | | -24.00 | | | |
| 59 | 300 | | -86.33 | | -98.60 | | -96.75 | | -98.80 | | -98.66 | | -99.17 | | -99.66 | | -99.65 | | | |
| 60 | 400 | | -88.25 | | -98.87 | | -97.50 | | -99.00 | | -98.82 | | -99.02 | | -99.65 | | -99.73 | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INS. RESISTANCE ; Unit: MEGOHMS X $10^3$
B = ; Unit:

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111a/C/1

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: CERAMIC CAPACITORS (PAINTED) Capacitance + Tangent of Loss Angle; ~~Dielectric~~ ~~Insulation~~ ~~Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/25/56 | | date: 5/28/56 | | date: 6/1/56 | | date: 6/8/56 | | date: 6/15/56 | | date: 6/22/56 | | date: 7/6/56 | | date: 7/20/56 | | date: 8/3/56 | | date: 8/17/56 | |
| | T: 23°C RH: 46 % | | T: 23°C RH: 46% | | T: 22 °C RH: 5% | | T: 22°C RH: 53 % | | T: 22°C RH: 50% | | T: 22 °C RH: 60% | | T: 21 °C RH: 59% | | T: 24 °C RH: 48% | | T: 23°C RH: 54 % | | T: 24°C RH: 59 % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 46 | 91.7 | .08 | 5.56 | 16.65 | 9.05 | 25.62 | 13.08 | 32.20 | 13.52 | 33.32 | 14.50 | 35.09 | REMOVED FROM TEST-INS. RES. BELOW 100 MEGOHMS | | | | | | | |
| 47 | 95.2 | .02 | 2.10 | 7.03 | 3.67 | 10.62 | 6.82 | 15.90 | 9.03 | 20.38 | 10.92 | 23.49 | 11.65 | 24.65 | 13.02 | 28.50 | RFT - LOW IR | | | |
| 48 | 101.0 | .09 | .20 | .21 | .10 | .10 | .39 | .44 | .30 | .51 | .40 | .66 | .69 | 1.03 | .59 | 1.36 | .68 | 1.43 | .89 | 1.92 |
| 49 | 97.5 | .08 | 0 | .06 | -.10 | .31 | 0 | .15 | -.10 | .09 | 0 | .14 | .10 | .26 | .10 | .50 | .31 | .76 | .44 | .75 |
| 50 | 98.2 | .05 | .20 | .36 | .30 | .74 | .81 | .27 | .71 | 1.41 | 1.22 | 2.03 | 1.42 | 2.54 | 1.42 | 2.90 | 1.42 | 2.82 | 1.22 | 2.42 |
| 51 | 100.1 | .02 | .29 | .26 | .30 | .39 | .49 | .53 | .60 | .64 | .70 | .90 | .89 | 1.23 | .70 | 1.41 | .99 | 1.75 | 1.10 | 2.01 |
| 52 | 95.6 | .01 | .73 | 1.95 | 1.36 | 3.71 | 2.30 | 5.30 | 2.82 | 7.02 | 4.60 | 8.84 | 4.92 | 11.45 | 5.65 | 13.80 | 4.40 | 10.43 | 3.14 | 7.21 |
| 53 | 101.0 | .04 | 0 | .22 | 0 | .31 | .39 | .41 | .30 | .52 | .40 | .71 | .79 | 1.22 | .79 | 1.66 | 1.19 | 2.13 | 1.00 | 2.03 |
| 54 | 101.7 | .07 | .19 | .26 | .10 | .32 | .49 | .52 | .49 | .71 | .59 | .88 | .88 | 1.29 | .79 | 1.70 | .98 | 1.78 | .79 | 1.81 |
| 55 | 101.8 | .07 | .29 | .29 | .49 | .61 | .08 | .71 | .69 | .88 | .88 | 1.15 | 1.18 | 1.61 | 1.37 | 2.19 | 1.57 | 2.39 | 1.37 | 2.34 |
| 56 | 99.6 | .05 | .50 | .66 | .70 | 1.09 | 1.50 | 1.93 | 1.71 | 2.29 | 2.11 | 2.82 | 3.61 | 4.64 | 3.91 | 5.66 | 5.12 | 7.38 | 3.21 | 5.50 |
| 57 | 98.2 | .04 | .10 | .09 | 0 | .03 | .10 | .08 | .10 | .08 | .20 | .11 | .20 | .22 | .10 | .35 | .20 | .41 | .20 | .37 |
| 58 | 100.6 | .06 | .10 | .26 | .20 | .37 | .39 | .54 | .30 | .53 | .50 | .67 | .61 | .88 | .50 | 1.08 | .69 | 1.27 | .50 | 1.14 |
| 59 | 98.9 | .08 | 0 | .07 | -.10 | .30 | 0 | .39 | .10 | .61 | 1.00 | 1.82 | 1.50 | 2.17 | 1.50 | 2.17 | 1.70 | 2.18 | 1.60 | 2.15 |
| 60 | 95.7 | .01 | 1.77 | 4.85 | 3.23 | 7.37 | 5.85 | 11.46 | 6.06 | 12.23 | 7.62 | 14.49 | 8.15 | 14.95 | 8.04 | 16.50 | 6.58 | 12.03 | 6.17 | 11.72 |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: pF
B = TAN OF LOSS ANG. ; Unit: X 10-3

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111a/C/2

**TEST REPORT**
Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: CERAMIC CAPACITORS (PAINTED) ~~Capacitance / Tangent of Loss Angle / Resistance~~ Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/25/56 | | date: 5/28/56 | | date: 6/1/56 | | date: 6/8/56 | | date: 6/15/56 | | date: 6/22/56 | | date: 7/6/56 | | date: 7/20/56 | | date: 8/3/56 | | date: 8/17/56 | |
| | T 23 °C RH 56 % | | T 23 °C RH 46 % | | T 22 °C RH 57 % | | T 22 °C RH 53 % | | T 22 °C RH 60 % | | T 22 °C RH 60 % | | T 21 °C RH 59 % | | T 24 °C RH 48 % | | T 23 °C RH 54 % | | T 24 °C RH 53 % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 46 | 700 | | -99.97 | | -99.99 | | -99.99 | | -99.99 | | -99.99 | | REMOVED FROM TEST - INS. RES. BELOW 100 MEGOHMS | | | | | | | |
| 47 | *1000 | | -99.68 | | -99.95 | | -99.96 | | -99.99 | | -99.97 | | -99.98 | | -99.99 | | RFT - LOW IR | | | |
| 48 | *1000 | | -30.00 | | -81.00 | | -88.00 | | -80.00 | | -95.10 | | -95.50 | | -90.00 | | -90.00 | | -91.00 | |
| 49 | *1000 | | 0 | | -70.00 | | -80.00 | | -60.00 | | -86.00 | | -91.00 | | -92.00 | | -93.10 | | -95.00 | |
| 50 | *1000 | | -81.00 | | -97.90 | | -98.50 | | -94.00 | | -97.00 | | -97.20 | | -93.00 | | -93.00 | | -92.50 | |
| 51 | *1000 | | -60.00 | | -86.00 | | -91.00 | | -82.00 | | -91.00 | | -95.40 | | -91.30 | | -95.50 | | -96.20 | |
| 52 | *1000 | | -94.90 | | -99.81 | | -99.90 | | -99.95 | | -99.83 | | -99.98 | | -99.98 | | -99.86 | | -99.98 | |
| 53 | *1000 | | 0 | | -50.00 | | -60.00 | | -50.00 | | -94.40 | | -93.20 | | -81.00 | | -75.00 | | -82.00 | |
| 54 | *1000 | | -81.00 | | -93.00 | | -93.00 | | -88.00 | | -97.55 | | -97.60 | | -94.80 | | -96.80 | | -97.30 | |
| 55 | *1000 | | -50.00 | | -91.00 | | -91.50 | | -70.00 | | -97.82 | | -97.10 | | -93.40 | | -94.50 | | -90.00 | |
| 56 | 1000 | | -92.30 | | -99.50 | | -99. | | -99.80 | | -99.78 | | -99.86 | | -99.86 | | -99.73 | | -99.79 | |
| 57 | *1000 | | -70.00 | | -85.00 | | -87.00 | | -81.00 | | -90.90 | | -90.00 | | -87.00 | | -82.00 | | -91.00 | |
| 58 | *1000 | | -50.00 | | -91.00 | | -93.00 | | -86.00 | | -97.30 | | -97.00 | | -96.50 | | -96.70 | | -96.50 | |
| 59 | *1000 | | 0 | | -91.00 | | -92.00 | | -91.00 | | -88.50 | | -99.95 | | -99.05 | | -99.76 | | -99.80 | |
| 60 | 800 | | -99.00 | | -99.46 | | -99.55 | | -99.91 | | -99.95 | | -99.96 | | -99.98 | | -99.98 | | -99.99 | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INS. RESISTANCE ; Unit: MEGOHMS X $10^3$
B = ; Unit:

* Greater than 1000

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111b/C/1

**TEST REPORT**
Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: CERAMIC CAPACITORS (PHENOLIC COATED) Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/28/56 T:22°C RH:65% | | date: 5/31/56 T:23°C RH:53% | | date: 6/4/56 T:22°C RH:52% | | date: 6/11/56 T:22°C RH:68% | | date: 6/18/56 T: 22°C RH: 56% | | date: 6/25/56 T:21°C RH:56% | | date: 7/9/56 T:21°C RH:64% | | date: 7/23/56 T:24°C RH: 66% | | date: 8/6/56 T:24°C RH:74% | | date: 8/20/56 T: 24°C RH:62% | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 46 | 105.4 | .05 | 0 | .05 | -.09 | .06 | -.28 | .10 | 0 | .14 | -.19 | .14 | -.19 | .19 | -.28 | .38 | -.38 | .38 | -.28 | .35 |
| 47 | 107.7 | .04 | 0 | .05 | -.09 | .05 | -.09 | .03 | -.18 | .05 | -.09 | .05 | .10 | .04 | 0 | .26 | -.28 | .33 | 0 | .30 |
| 48 | 103.6 | .06 | 0 | .01 | .09 | .03 | 0 | .03 | 0 | .07 | 0 | .04 | 0 | .09 | .10 | .27 | -.29 | .32 | -.10 | .32 |
| 49 | 102.9 | .04 | 0 | .08 | -.09 | .02 | -2.04 | .05 | -.19 | .07 | -.10 | .05 | -.10 | .07 | -.10 | .25 | -.29 | .32 | -.19 | .27 |
| 50 | 106.3 | .07 | .09 | .03 | .09 | .04 | 1.12 | .10 | -.09 | .18 | -.19 | .13 | .19 | .15 | .19 | .32 | -.28 | .38 | .09 | .37 |
| 51 | 97.8 | .07 | -.20 | .01 | -.20 | .04 | -.20 | .07 | -.31 | .12 | -.20 | .10 | -.10 | .11 | -.10 | .30 | -.10 | .30 | -.41 | .33 |
| 52 | 104.7 | .01 | -.19 | .04 | -.28 | .02 | 1.62 | .18 | -.19 | .14 | -.29 | .15 | -.19 | .11 | -.20 | .30 | -.29 | .34 | -.19 | .33 |
| 53 | 105.9 | .05 | -.09 | .04 | -.09 | .02 | -.09 | .03 | -.09 | .08 | -.09 | .08 | 0 | .09 | 0 | .24 | 0 | .30 | -.19 | .28 |
| 54 | 105.9 | .03 | -.09 | .02 | -.09 | .01 | 0 | .04 | -.09 | .10 | .09 | .07 | -.09 | .07 | 0 | .25 | -.19 | .31 | 0 | .29 |
| 55 | 102.6 | .03 | -.29 | .03 | -.38 | .03 | -.29 | .05 | -.29 | .08 | -.19 | .06 | -.29 | .09 | .58 | .27 | -.39 | .32 | -.19 | .27 |
| 56 | 97.7 | .08 | -.10 | .05 | -.10 | .06 | -.10 | .11 | 0 | .11 | -.20 | .14 | -.10 | .19 | .10 | .33 | -.10 | .42 | -.10 | .30 |
| 57 | 105.3 | .07 | 0 | .01 | 0 | .05 | -.09 | .03 | -.09 | .04 | 0 | .04 | 0 | .05 | -.09 | .26 | -.19 | .33 | 0 | .30 |
| 58 | 103.8 | .06 | .09 | .02 | .09 | .01 | .09 | .03 | .29 | .02 | .10 | .03 | .29 | .09 | .19 | .29 | -.10 | .33 | .19 | .33 |
| 59 | 94.8 | .04 | -.21 | .03 | -.21 | .05 | .73 | .03 | 2.85 | .05 | -.21 | .05 | -.21 | .10 | -.10 | .24 | -.42 | .35 | -.21 | .28 |
| 60 | 103.7 | .07 | .09 | .01 | .09 | .05 | -.29 | .04 | -.19 | .07 | -.10 | .05 | -.10 | .08 | -.10 | .28 | -.38 | .31 | -.19 | .31 |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH= relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF
B = TAN OF LOSS ANG. ; Unit: $X\ 10^{-3}$

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111b/C/2

# TEST REPORT
Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: CERAMIC CAPACITORS (PHENOLIC COATED) ~~Capacitance; Tangent of Loss Angle; Resistance;~~ Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/28/56 | | date: 5/31/56 | | date: 6/4/56 | | date: 6/11/56 | | date: 6/18/56 | | date: 6/25/56 | | date: 7/9/56 | | date: 7/23/56 | | date: 8/6/56 | | date: 8/20/56 | |
| | T:22°C RH:65% | | T:23 °C RH:53% | | T:22°C RH:52% | | T:22°C RH:68% | | T:22°C RH:56% | | T:21°C RH:56% | | T:21 °C RH: 64% | | T: 24°C RH:66% | | T: 24°C RH: 74% | | T:24 °C RH62 % | |
| | A | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B |
| 46 | 500 | | -20.00 | | -70.00 | | -95.40 | | -96.40 | | -96.70 | | -97.00 | | -96.40 | | -95.20 | | -95.40 | |
| 47 | 500 | | -20.00 | | -40.00 | | -40.00 | | -61.00 | | -78.00 | | -98.20 | | -97.20 | | -97.40 | | -98.20 | |
| 48 | 500 | | -20.00 | | -40.00 | | -40.00 | | -55.00 | | -76.00 | | -97.60 | | -95.40 | | -97.65 | | -98.84 | |
| 49 | 300 | | 66.66 | | 0 | | -25.00 | | -43.33 | | -70.00 | | -91.00 | | -88.66 | | -84.33 | | -86.66 | |
| 50 | 300 | | 0 | | -49.00 | | -85.33 | | -89.33 | | -90.16 | | -96.83 | | -94.66 | | -93.33 | | -95.83 | |
| 51 | 400 | | 0 | | -25.00 | | -52.50 | | -79.25 | | -83.75 | | -91.50 | | -90.25 | | -96.87 | | -96.37 | |
| 52 | 500 | | -40.00 | | -62.00 | | -89.60 | | -91.00 | | -90.80 | | -89.60 | | -92.00 | | -94.40 | | -97.40 | |
| 53 | 300 | | 0 | | 0 | | -16.66 | | -73.33 | | -66.66 | | -92.33 | | -85.66 | | -96.33 | | -93.66 | |
| 54 | 400 | | 0 | | -25.00 | | -55.00 | | -72.50 | | -82.25 | | -77.50 | | -80.00 | | -84.50 | | -88.75 | |
| 55 | 400 | | 0 | | -37.50 | | -25.00 | | -37.50 | | -67.50 | | -96.75 | | -88.00 | | -93.60 | | -94.25 | |
| 56 | 400 | | 0 | | -70.00 | | -86.25 | | -88.75 | | -89.50 | | -95.81 | | -97.00 | | -99.60 | | -99.65 | |
| 57 | 300 | | 0 | | 0 | | 0 | | -35.00 | | -60.00 | | -81.67 | | -90.66 | | -96.33 | | -92.00 | |
| 58 | 400 | | -25.00 | | -25.00 | | -43.75 | | -52.50 | | -82.50 | | -98.50 | | -93.50 | | -98.50 | | -98.50 | |
| 59 | 800 | | 66.66 | | 33.00 | | -16.66 | | -36.66 | | -67.00 | | -98.00 | | -90.66 | | -92.00 | | -94.00 | |
| 60 | 500 | | -20.00 | | -40.00 | | -40.00 | | -50.00 | | -78.00 | | -87.00 | | -86.00 | | -95.20 | | -99.60 | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH= relative humidity in laboratory.

A = INS. RESISTANCE ; Unit: MEGOHMS X $10^3$
B = ; Unit:

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111c/C/1

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (WAX DIPPED) Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/26/56 | | date: 5/31/56 | | date: 6/4/56 | | date: 6/11/56 | | date: 6/18/56 | | date: 6/25/56 | | date: 7/9/56 | | date: 7/23/56 | | date: 8/6/56 | | date: 8/20/56 | |
| | T: 22°C RH 65% | | T: 23°C RH 53% | | T: 26°C RH: 71% | | T 24°C RH: 70% | | T 24° RH 70% | | T 30°C RH 53% | | T 21°C RH: 64 | | T: 24°C RH 66% | | T: 24°C RH: 74% | | T 24°C RH: 62% | |
| | A | B | A Δ% | B Δ% | A Δ% | B Δ% | A Δ% | B Δ% | A Δ% | B Δ% | A Δ% | B Δ% | A Δ% | B Δ% | A Δ% | B Δ% | A Δ% | B Δ% | A Δ% | B Δ% |
| 46 | 49.40 | 5.34 | .14 | -8.05 | .14 | -2.24 | .26 | .94 | .22 | -2.62 | .28 | -1.87 | .63 | 20.60 | 1.92 | 113.48 | REMOVED FROM TEST | | | |
| 47 | 48.21 | 5.34 | .19 | -6.36 | .21 | -2.62 | .24 | 2.06 | .23 | -2.99 | .21 | -2.99 | .35 | 4.87 | .52 | -2.06 | .82 | 8.05 | 1.47 | 34.08 |
| 48 | 49.08 | 5.40 | .14 | -5.18 | .12 | 0 | .22 | 2.96 | .16 | -3.15 | .22 | -3.70 | .14 | 5.18 | .45 | -4.07 | .41 | 0 | .49 | 3.70 |
| 49 | 46.09 | 5.19 | .19 | -6.86 | .26 | .40 | .39 | 1.96 | .33 | - .98 | .30 | -2.94 | .41 | 2.94 | .58 | -4.12 | .89 | 28.82 | 2.21 | 146.66 |
| 50 | 51.29 | 5.46 | .10 | -4.03 | .06 | 1.83 | .15 | 6.04 | .25 | -.18 | .44 | 13.18 | REMOVED FROM TEST - LOW INS. RESISTANCE | | | | | | | |
| 51 | 50.03 | 5.54 | .08 | -2.01 | .10 | -1.62 | .16 | 2.71 | .16 | -4.51 | .26 | -2.17 | .34 | 18.41 | 1.62 | 89.53 | REMOVED FROM TEST | | | |
| 52 | 48.87 | 4.94 | .12 | -1.41 | .16 | - .20 | .39 | 5.26 | .33 | 4.05 | .59 | 8.48 | 1.86 | 94.33 | REMOVED FROM TEST - LOW IR | | | | | |
| 53 | 52.87 | 5.36 | .09 | -5.04 | .13 | -2.24 | .32 | 4.48 | .43 | 1.49 | .85 | 33.40 | 2.48 | 149.07 | REMOVED FROM TEST - LOW IR | | | | | |
| 54 | 48.38 | 5.38 | .16 | -2.60 | .24 | .37 | .36 | 3.72 | .34 | - .18 | .45 | 4.83 | .63 | 7.81 | 1.13 | 38.10 | REMOVED FROM TEST | | | |
| 55 | 51.44 | 5.03 | .08 | -5.56 | .10 | .20 | .25 | 2.98 | .29 | 4.17 | .60 | 16.70 | 1.92 | 91.45 | 4.47 | 260.90 | REMOVED FROM TEST | | | |
| 56 | 53.46 | 5.32 | .06 | -5.64 | .09 | -1.31 | .17 | 7.14 | .37 | 3.95 | REMOVED FROM TEST - LOW INS. RESISTANCE | | | | | | | | | |
| 57 | 52.16 | 5.64 | .21 | -4.25 | .31 | 5.67 | .88 | 39.00 | 1.74 | 102.13 | REMOVED FROM TEST - LOW INS. RESISTANCE | | | | | | | | | |
| 58 | 49.20 | 5.33 | .14 | -6.38 | .14 | -2.44 | .12 | 2.44 | .08 | -2.06 | .18 | -1.88 | .20 | 7.70 | 1.37 | 8.54 | 1.84 | 30.95 | 2.15 | 87.62 |
| 59 | 48.79 | 5.15 | .16 | -3.11 | .20 | - .77 | .39 | 4.85 | .49 | 4.27 | .65 | 22.33 | REMOVED FROM TEST - LOW INS. RESISTANCE | | | | | | | |
| 60 | 50.49 | 5.13 | .16 | -6.82 | .14 | -1.56 | .25 | .78 | .22 | -2.14 | .32 | - .97 | .63 | 31.19 | REMOVED FROM TEST - LOW IR | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF X $10^3$
B = TAN OF LOSS ANG. ; Unit: X $10^{-3}$

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111c/C/2

# TEST REPORT
Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (WAX DIPPED) ~~Capacitance / Tangent of Loss Angle, Resistance~~; Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date 5/28/56 | | date: 5/31/56 | | date: 6/4/56 | | date: 6/11/56 | | date: 6/18/56 | | date: 6/25/56 | | date: 7/9/56 | | date: 7/23/56 | | date: 8/6/56 | | date: 8/20/56 | |
| | T: 22°C RH: 65 % | | T: 23°C RH: 53% | | T: 26°C RH: 71 % | | T: 24°C RH: 70 % | | T: 24°C RH: 70 % | | T: 30°C RH: 53 % | | T: 21 °C RH: 64% | | T: 24 °C RH: 66 % | | T: 24°C RH: 74 % | | T: 24 °C RH: 62% | |
| | A | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A % | B | A | B | A % | B |
| 46 | 50 | | -32.00 | | -30.00 | | -36.00 | | -96.20 | | -99.61 | | -99.97 | | -92.99 | | | | | |
| 47 | 29 | | 103.44 | | 13.79 | | 3.44 | | -34.48 | | -13.79 | | -73.80 | | -89.65 | | -98.34 | | -99.83 | |
| 48 | 31 | | -16.12 | | -29.03 | | -6.45 | | -16.12 | | -32.25 | | -35.48 | | -32.25 | | -77.42 | | -93.87 | |
| 49 | 45 | | - 2.22 | | -44.44 | | -13.33 | | -48.88 | | -28.89 | | -40.00 | | -95.33 | | -99.92 | | -99.99 | |
| 50 | 43 | | -13.95 | | -81.39 | | -99.85 | | -99.96 | | -99.99 | | | | | | | | | |
| 51 | 35 | | 17.14 | | -28.57 | | -31.42 | | -83.43 | | -95.71 | | -99.80 | | -99.98 | | | | | |
| 52 | 24.5 | | 6.12 | | -24.49 | | -63.26 | | -99.10 | | -99.86 | | -99.97 | | | | | | | |
| 53 | 27.5 | | 63.64 | | -60.00 | | -94.54 | | -99.65 | | -99.92 | | -99.98 | | | | | | | |
| 54 | 29 | | - 5.17 | | -10.34 | | -24.14 | | -95.68 | | -99.09 | | -99.89 | | -99.97 | | | | | |
| 55 | 41 | | 4.88 | | -29.27 | | -65.85 | | -99.22 | | -99.88 | | -99.97 | | -99.99 | | | | | |
| 56 | 26 | | -11.54 | | -80.77 | | -99.69 | | -99.97 | | | | | | | | | | | |
| 57 | 3.95 | | -35.44 | | -96.83 | | -99.96 | | -99.90 | | | | | | | | | | | |
| 58 | 47 | | -19.15 | | -40.42 | | -57.44 | | -68.08 | | -84.04 | | -95.53 | | -99.76 | | -99.94 | | -99.99 | |
| 59 | 28 | | 0 | | -14.28 | | 95.71 | | -99.88 | | -99.98 | | | | | | | | | |
| 60 | 50 | | -26.00 | | -40.00 | | -60.00 | | -98.00 | | -99.87 | | -99.99 | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INS. RESISTANCE ; Unit: MEGOHMS X $10^3$
B = ; Unit:

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111d/C/1

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: RESISTORS (CRACKED CARBON, LAQUAR COATING)

~~Capacitance; Tangent of Loss Angle;~~ Resistance; ~~Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/25/56 | | date: 5/28/56 | | date: 6/1/56 | | date: 6/8/56 | | date: 6/15/56 | | date: 6/22/56 | | date: 7/6/56 | | date: 7/20/56 | | date: 8/3/56 | | date: 8/17/56 | |
| | T: 22°C RH: 56% | | T: 22 °C RH: 65% | | T: 29°C RH: 62% | | T: 29°C RH: 56% | | T: 29°C RH: 46% | | T: 22 °C RH: 57% | | T: 23 °C RH: 61% | | T: 24°C RH: 48% | | T: 27 °C RH: 38% | | T: 24 °C RH: 59% | |
| | A | B | A Ω | B | A Ω | B | A Ω | B | A Ω | B | A Ω | B | A Ω | B | A Ω | B | A Ω | B | A Ω | B |
| 46 | 507980 | | 1.12 | | 1.16 | | 1.31 | | 1.55 | | 1.75 | | 1.81 | | 1.93 | | 1.90 | | 2.11 | |
| 47 | 62840 | | - .40 | | 1.56 | | 4.06 | | 5.90 | | 6.29 | | 6.89 | | 7.87 | | 8.09 | | 9.60 | |
| 48 | 478670 | | .41 | | .41 | | .42 | | .65 | | .71 | | .67 | | .86 | | .86 | | 1.10 | |
| 49 | 479210 | | .75 | | .95 | | 1.40 | | 1.99 | | 2.23 | | 2.34 | | 2.45 | | 2.62 | | 2.84 | |
| 50 | 471000 | | .52 | | .50 | | .73 | | .99 | | 1.10 | | 1.17 | | 1.22 | | 1.21 | | 1.46 | |
| 51 | 514440 | | .41 | | .65 | | 1.92 | | 2.76 | | 3.05 | | 3.22 | | 3.49 | | 3.67 | | 3.94 | |
| 52 | 506430 | | 1.03 | | 1.03 | | 1.09 | | 1.32 | | 1.60 | | 1.75 | | 1.77 | | 1.74 | | 2.04 | |
| 53 | 476330 | | .63 | | .62 | | .91 | | 1.30 | | 1.47 | | 1.66 | | 1.78 | | 1.78 | | 2.00 | |
| 54 | 477780 | | .97 | | 1.13 | | 1.64 | | 2.37 | | 2.55 | | 2.85 | | 2.91 | | 3.02 | | 3.21 | |
| 55 | 491320 | | .59 | | .65 | | .89 | | 1.28 | | 1.42 | | 1.63 | | 1.70 | | 1.83 | | 1.94 | |
| 56 | 511110 | | .56 | | .56 | | .95 | | 1.51 | | 1.56 | | 1.72 | | 1.90 | | 2.32 | | 2.23 | |
| 57 | 511840 | | .76 | | .74 | | 1.22 | | 1.70 | | 1.75 | | 2.12 | | 2.21 | | 2.15 | | 2.43 | |
| 58 | 494340 | | .65 | | 1.07 | | .86 | | -.97 | | 1.08 | | 1.27 | | 1.28 | | 1.31 | | 1.49 | |
| 59 | 495340 | | .90 | | .73 | | 1.29 | | 1.93 | | 1.31 | | 1.44 | | 2.00 | | 1.85 | | 2.38 | |
| 60 | 468260 | | .55 | | .44 | | .52 | | .79 | | .97 | | 1.17 | | 1.11 | | 1.00 | | 1.24 | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = RESISTANCE ; Unit: OHMS
B = ; Unit:

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 18/J/1

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (METAL WITH GLASS) Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~*

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/8/56 | | date: | | date: 5/18/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 23°C RH: 39% | | T: °C RH: % | | T: 23°C RH: 53% | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A | B | A % | B % | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 43.77 | 4.10 | | | .59 | 9.7 | | | | | | | | | | | | | | |
| 62 | 42.32 | 4.20 | | | .63 | 0 | | | | | | | | | | | | | | |
| 63 | 43.32 | 4.30 | | | .66 | -4.6 | | | | | | | | | | | | | | |
| 64 | 42.50 | 3.91 | | | .63 | 5.1 | | | | | | | | | | | | | | |
| 65 | 48.55 | 3.36 | | | .49 | -5.4 | | | | | | | | | | | | | | |
| 66 | 48.63 | 3.40 | | | .49 | 2.9 | | | | | | | | | | | | | | |
| 67 | 48.87 | 3.39 | | | .47 | -12.5 | | | | | | | | | | | | | | |
| 68 | 48.50 | 3.58 | | | .57 | -2.6 | | | | | | | | | | | | | | |
| 69 | 48.50 | 3.45 | | | .33 | 5.8 | | | | | | | | | | | | | | |
| 70 | 48.57 | 3.50 | | | .53 | 2.8 | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF X $10^3$
B = LOSS TANGENT ; Unit: X $10^{-3}$

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 1a/J/2

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO. INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (METAL WITH GLASS)

~~Capacitance; Tangent of Loss Angle; Resistance~~; Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/8/56 | | date: 5/11/56 | | date: 5/18/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 23 °C RH: 39 % | | T: 24 °C RH: 48 % | | T: 23 °C RH: 53 % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 100 | 800 | 140 | 600 | 180 | *1000 | | | | | | | | | | | | | | |
| 62 | 150 | 800 | 180 | *1000 | 200 | 900 | | | | | | | | | | | | | | |
| 63 | 200 | 800 | 170 | 750 | 200 | *1000 | | | | | | | | | | | | | | |
| 64 | 80 | 1000 | 300 | 1000 | 92 | 900 | | | | | | | | | | | | | | |
| 65 | 150 | 700 | 90 | *1000 | 220 | 1000 | | | | | | | | | | | | | | |
| 66 | 100 | 500 | 180 | 750 | 170 | 600 | | | | | | | | | | | | | | |
| 67 | 150 | 500 | 70 | 750 | 200 | 500 | | | | | | | | | | | | | | |
| 68 | 210 | 600 | 90 | 500 | 200 | *1000 | | | | | | | | | | | | | | |
| 69 | 130 | 800 | 100 | 600 | 120 | *1000 | | | | | | | | | | | | | | |
| 70 | 100 | 700 | 60 | 1000 | 95 | 1000 | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INSULATION RES. ; Unit: MEGOHMS X $10^3$ TERM. TO TERM.
B = INSULATION RES. ; Unit: MEGOHMS X $10^3$ TERMS. TO CASE

\# Greater than 1000

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 1b/J/1

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING CO. INC. Country: UNITED STATES

Type of Component: PAPER CAPACITOR (METAL WITH NEOPRENE) Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/9/56 | | date: | | date: 5/19/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 21°C RH: 51% | | T: °C RH: % | | T: 24°C RH: 58% | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 47.25 | 4.15 | | | 0.5% | 0.7% | | | | | | | | | | | | | | |
| 62 | 50.83 | 4.15 | | | 0.5 | 1.2 | | | | | | | | | | | | | | |
| 63 | 50.69 | 4.25 | | | 0.8 | 1.0 | | | | | | | | | | | | | | |
| 64 | 45.93 | 4.05 | | | 0.2 | 1.1 | | | | | | | | | | | | | | |
| 65 | 50.33 | 4.22 | | | 0.8 | 2.2 | | | | | | | | | | | | | | |
| 66 | 52.72 | 3.65 | | | 0.8 | 4.0 | | | | | | | | | | | | | | |
| 67 | 46.68 | 3.90 | | | 0.2 | 1.8 | | | | | | | | | | | | | | |
| 68 | 46.91 | 3.95 | | | 0.3 | 2.5 | | | | | | | | | | | | | | |
| 69 | 46.33 | 3.95 | | | 0.9 | 3.9 | | | | | | | | | | | | | | |
| 70 | 54.32 | 4.20 | | | 0.5 | 0.2 | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: 1F X $10^3$
B = TAN OF LOSS ANGLE ; Unit: X $10^{-3}$

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 1b/J/2

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING COMPANY, INC. Country: UNITED STATES

Type of Component: PAPER CAPACITOR (METAL WITH NEOPRENE) ~~Capacitance / Tangent of Loss Angle/ Resistance~~ Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/9/56 | | date: 5/14/56 | | date: 5/19/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 21 °C RH: 51 % | | T 26 °C RH: 60% | | T: 24 °C RH: 58 % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 44 | 900 | 40 | 600 | 32 | 300 | | | | | | | | | | | | | | |
| 62 | 39 | *1000 | 39 | 700 | 42 | 700 | | | | | | | | | | | | | | |
| 63 | 37 | 600 | 24 | 700 | 41 | 700 | | | | | | | | | | | | | | |
| 64 | 55 | 1000 | 60 | 600 | 62 | 500 | | | | | | | | | | | | | | |
| 65 | 51 | 700 | 30 | 1000 | 33 | 700 | | | | | | | | | | | | | | |
| 66 | 64 | 1000 | 34 | 600 | 30 | 1000 | | | | | | | | | | | | | | |
| 67 | 48 | 700 | 36 | *1000 | 38 | *1000 | | | | | | | | | | | | | | |
| 68 | 34 | *1000 | 20 | 1000 | 47 | 1000 | | | | | | | | | | | | | | |
| 69 | 70 | 500 | 52 | 500 | 43 | 700 | | | | | | | | | | | | | | |
| 70 | 44 | 1000 | 42 | 500 | 86 | 800 | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INSULATION T-T ; Unit: MEGOHMS X $10^3$
B = RESISTANCE ; Unit: MEGOHMS X $10^3$

T-G

# Greater than 1000

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 11/J/1

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (PHENOLIC MOLDING) Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/10/56 | | date: | | date: 5/21/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 21 °C RH 51 % | | T: °C RH: % | | T: 26 °C RH 46 % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A | B | A % | B % | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 7.979 | 4.18 | | | .30 | 2.0 | | | | | | | | | | | | | | |
| 62 | 7.225 | 4.10 | | | .34 | 0 | | | | | | | | | | | | | | |
| 63 | 8.033 | 4.65 | | | .36 | 6.5 | | | | | | | | | | | | | | |
| 64 | 7.853 | 4.12 | | | 5.81 | 2.0 | | | | | | | | | | | | | | |
| 65 | 7.950 | 4.10 | | | .26 | 2.0 | | | | | | | | | | | | | | |
| 66 | 7.500 | 4.20 | | | .54 | 2.0 | | | | | | | | | | | | | | |
| 67 | 7.154 | 4.08 | | | .51 | 4.0 | | | | | | | | | | | | | | |
| 68 | 7.608 | 5.78 | | | .64 | 18.9 | | | | | | | | | | | | | | |
| 69 | 8.002 | 4.38 | | | .37 | 2.0 | | | | | | | | | | | | | | |
| 70 | 6.487 | 3.30 | | | .29 | 3.0 | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF X $10^3$
B = LOSS TANGENT ; Unit: X $10^{-3}$

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 11/J/2

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: PAPER CAPACITORS (PHENOLIC MOLDING) ~~Capacitance / Tangent of Loss Angle / Resistance~~ / Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/10/56 | | date: 5/14/56 | | date: 5/21/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 21 °C RH: 51 % | | T: 26 °C RH: 60 % | | T: 26 °C RH: 46 % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 1000 | | -99.6 | | -88 | | | | | | | | | | | | | | | |
| 62 | 1000 | | -99.0 | | -90 | | | | | | | | | | | | | | | |
| 63 | 2.7 | | -55.5 | | -25.9 | | | | | | | | | | | | | | | |
| 64 | 600 | | -58.3 | | -50 | | | | | | | | | | | | | | | |
| 65 | 700 | | -99.6 | | -87 | | | | | | | | | | | | | | | |
| 66 | 300 | | 0 | | -33 | | | | | | | | | | | | | | | |
| 67 | 500 | | -5.0 | | -80 | | | | | | | | | | | | | | | |
| 68 | 1.2 | | ∠333 | | ∠466 | | | | | | | | | | | | | | | |
| 69 | 400 | | -97.9 | | -80 | | | | | | | | | | | | | | | |
| 70 | 300 | | -99.1 | | -60 | | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INSULATION RES. ; Unit: MEGOHMS X $10^3$
B = ; Unit:

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111a/J/1

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING COMPANY, INC. Country: UNITED STATES

Type of Component: CERAMIC CAPACITOR (PAINTED) Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/14/56 | | date: | | date: 5/15/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 21°C RH: 50 % | | T: °C RH: % | | T: 22°C RH 42 % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 98.8 | 0.10 | | | 1.8 | 0.25 | | | | | | | | | | | | | | |
| 62 | 98.8 | 0.06 | | | 0.1 | 0.03 | | | | | | | | | | | | | | |
| 63 | 100.6 | 0.09 | | | 0.1 | 0.11 | | | | | | | | | | | | | | |
| 64 | 99.0 | 0.08 | | | 0.2 | 0.51 | | | | | | | | | | | | | | |
| 65 | 97.6 | 0.19 | | | 0.2 | 0.32 | | | | | | | | | | | | | | |
| 66 | 98.4 | 0.09 | | | 0.5 | 0.42 | | | | | | | | | | | | | | |
| 67 | 100.4 | 0.14 | | | 0.7 | 0.44 | | | | | | | | | | | | | | |
| 68 | 100.5 | 0.15 | | | 0.2 | 0.19 | | | | | | | | | | | | | | |
| 69 | 099.1 | 0.07 | | | 0.1 | 0.04 | | | | | | | | | | | | | | |
| 70 | 098.4 | 0.06 | | | 0.1 | 0.01 | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF
B = TAN OF LOSS ANGLE ; Unit: $X\ 10^{-3}$

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111a/J/2

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING COMPANY, INC. Country: UNITED STATES

Type of Component: CERAMIC CAPACITOR (PAINTED) ~~Capacitance; Tangent of Loss Angle; Resistance~~; Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/4/56 | | date: 5/10/56 | | date: 5/15/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 21 °C RH: 50 % | | T: 22 °C RH: 52 % | | T: 22 °C RH: 42 % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A % | B | A % | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 1000 | | -99.8 | | 0 | | | | | | | | | | | | | | | |
| 62 | 750 | | -97.2 | | 33.0 | | | | | | | | | | | | | | | |
| 63 | 1000 | | -93.8 | | -40.0 | | | | | | | | | | | | | | | |
| 64 | 1000 | | -99.2 | | -60.0 | | | | | | | | | | | | | | | |
| 65 | 1000 | | -98.5 | | -30.0 | | | | | | | | | | | | | | | |
| 66 | 1000 | | -99.3 | | -30.0 | | | | | | | | | | | | | | | |
| 67 | 1000 | | -99.7 | | -83.0 | | | | | | | | | | | | | | | |
| 68 | 1000 | | -98.5 | | -30.0 | | | | | | | | | | | | | | | |
| 69 | 1000 | | -91.0 | | 0 | | | | | | | | | | | | | | | |
| 70 | 1000 | | -99.0 | | -40.0 | | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH= relative humidity in laboratory.

A = INSULATION ; Unit: MEGOHMS X $10^3$
B = RESISTANCE ; Unit:

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111b/J/1

**TEST REPORT**
Humidity test for Components

Test Laboratory: UNITED STATES TESTING COMPANY, INC. Country: UNITED STATES

Type of Component: CERAMIC CAPACITOR, (PHENOLIC COATING) Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/7/56 | | date: | | date: 5/18/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 21°C RH: 56% | | T: °C RH: % | | T: 23°C RH: 61% | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 093.8 | 0.17 | | | 0.1 | 0.09 | | | | | | | | | | | | | | |
| 62 | 103.9 | 0.15 | | | 0 | 0.08 | | | | | | | | | | | | | | |
| 63 | 197.2 | 0.18 | | | 0.8 | 0.05 | | | | | | | | | | | | | | |
| 64 | 103.6 | 0.20 | | | 0.2 | 0.06 | | | | | | | | | | | | | | |
| 65 | 192.9 | 0.28 | | | 0.5 | 0.18 | | | | | | | | | | | | | | |
| 66 | 96.3 | 0.33 | | | 0.2 | 0.23 | | | | | | | | | | | | | | |
| 67 | 104.2 | 0.15 | | | 0.1 | 0.10 | | | | | | | | | | | | | | |
| 68 | 109.8 | 0.18 | | | 0.1 | 0.10 | | | | | | | | | | | | | | |
| 69 | 094.2 | 0.17 | | | 0.1 | 0.10 | | | | | | | | | | | | | | |
| 70 | 97.8 | 0.18 | | | 0.2 | 0.08 | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH= relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF
B = LOSS TANGENT ; Unit: X 10-3

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111b/J/2

**TEST REPORT**
**Humidity test for Components**

Test Laboratory: UNITED STATES TESTING CO., INC. Country: UNITED STATES

Type of Component: CERAMIC CAPACITOR, (PHENOLIC COATING) ~~Capacitance, Tangent of Loss Angle, Resistance~~ Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/7/56 | | date: 5/10/56 | | date: 5/18/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 21°C RH: 50 % | | T 25 °C RH: 59% | | T: 23°C RH 61 % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 500 | | -40.0 | | -40.0 | | | | | | | | | | | | | | | |
| 62 | 400 | | -25.0 | | -37.5 | | | | | | | | | | | | | | | |
| 63 | 300 | | -33.3 | | -33.3 | | | | | | | | | | | | | | | |
| 64 | 500 | | -50.0 | | -50.0 | | | | | | | | | | | | | | | |
| 65 | 500 | | -40.0 | | -40.0 | | | | | | | | | | | | | | | |
| 66 | 500 | | -62.0 | | -20.0 | | | | | | | | | | | | | | | |
| 67 | 500 | | -50.0 | | -40.0 | | | | | | | | | | | | | | | |
| 68 | 400 | | -55.0 | | -25.0 | | | | | | | | | | | | | | | |
| 69 | 500 | | -50.0 | | -50.0 | | | | | | | | | | | | | | | |
| 70 | 300 | | 16.8 | | 0 | | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INSULATION RESISTANCE ; Unit: MEGOHMS X $10^3$
B = ; Unit:

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111c/J/1

# TEST REPORT
Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: PAPER CAPACITOR, WAX DIPPED

Capacitance + Tangent of Loss Angle; ~~Resistance; Insulation Resistance~~ *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/7/56 | | date: | | date: 5/18/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 22°C RH: 51 % | | T: °C RH: % | | T: 23°C RH: 53 % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A | B | A % | B % | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 50.70 | 5.05 | | | .53 | 18.2 | | | | | | | | | | | | | | |
| 62 | 50.48 | 5.60 | | | .61 | 12.5 | | | | | | | | | | | | | | |
| 63 | 53.50 | 5.18 | | | .16 | 12.0 | | | | | | | | | | | | | | |
| 64 | 49.95 | 5.50 | | | -.18 | 8.2 | | | | | | | | | | | | | | |
| 65 | 48.65 | 5.58 | | | 1.13 | 7.5 | | | | | | | | | | | | | | |
| 66 | 49.98 | 5.04 | | | .74 | 14.1 | | | | | | | | | | | | | | |
| 67 | 49.84 | 5.25 | | | .58 | 6.9 | | | | | | | | | | | | | | |
| 68 | 51.95 | 5.30 | | | .69 | 13.2 | | | | | | | | | | | | | | |
| 69 | 51.40 | 5.25 | | | .54 | 14.3 | | | | | | | | | | | | | | |
| 70 | 50.21 | 5.50 | | | .41 | 7.3 | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = CAPACITANCE ; Unit: PF X $10^3$
B = TAN OF LOSS ANGLE ; Unit: X $10^{-3}$

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111c/J/2

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING CO., INC. Country: U.S.A.

Type of Component: PAPER CAPACITOR, WAX DIPPED ~~Capacitance, Tangent of Loss Angle, Resistance~~, Insulation Resistance *

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/7/56 | | date: 5/10/56 | | date: 5/18/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 22°C RH: 51 % | | T: 25°C RH: 59% | | T: 23°C RH: 53% | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A % | B | A % | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 70 | | -34.2 | | -67.1 | | | | | | | | | | | | | | | |
| 62 | 30 | | -26.6 | | -53.3 | | | | | | | | | | | | | | | |
| 63 | 35 | | 14.2 | | 8.5 | | | | | | | | | | | | | | | |
| 64 | 50 | | -24.0 | | -34.0 | | | | | | | | | | | | | | | |
| 65 | 51 | | -31.2 | | -88.2 | | | | | | | | | | | | | | | |
| 66 | 60 | | 0 | | -63.3 | | | | | | | | | | | | | | | |
| 67 | 55 | | -54.5 | | -45.4 | | | | | | | | | | | | | | | |
| 68 | 29 | | -51.7 | | -55.1 | | | | | | | | | | | | | | | |
| 69 | 43 | | -25.5 | | 6.9 | | | | | | | | | | | | | | | |
| 70 | 50 | | -38.0 | | -40.0 | | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = INS. RESIS. ; Unit: X $10^3$
B = ; Unit:

IEC 40 (WG) 1: Appendix IV

International Electrotechnical Commission
Technical Committee No. 40 Electronic Components
Working-group: Revision Publication No. 68

Sheet No. 111d/J/1

# TEST REPORT
## Humidity test for Components

Test Laboratory: UNITED STATES TESTING COMPANY, INC. Country: UNITED STATES

Type of Component: RESISTOR, (CRACKED CARBON, LAQUER COATING) ~~Capacitance; Tangent of Loss Angle;~~ Resistance; ~~Insulation Resistance*~~

| | Initial meas | | 1st meas | | 2nd meas | | 3rd meas | | 4th meas | | 5th meas | | 6th meas | | 7th meas | | 8th meas | | 9th meas | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | date: 5/3/56 | | date: 5/15/56 | | date: | | date: | | date: | | date: | | date: | | date: | | date: | | date: | |
| | T: 23 °C RH: 61 % | | T: 24 °C RH: 55% | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | | T: °C RH: % | |
| | A | B | A % | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B | A | B |
| 61 | 499.47 | | 0.8 | | | | | | | | | | | | | | | | | |
| 62 | 480.37 | | 0.9 | | | | | | | | | | | | | | | | | |
| 63 | 487.57 | | 1.1 | | | | | | | | | | | | | | | | | |
| 64 | 491.19 | | 1.2 | | | | | | | | | | | | | | | | | |
| 65 | 505.85 | | 11.2 | | | | | | | | | | | | | | | | | |
| 66 | 495.97 | | 0.8 | | | | | | | | | | | | | | | | | |
| 67 | 474.05 | | 0.5 | | | | | | | | | | | | | | | | | |
| 68 | 473.68 | | 1.1 | | | | | | | | | | | | | | | | | |
| 69 | 486.66 | | 1.1 | | | | | | | | | | | | | | | | | |

* Delete if not applicable.

T = ambient temperature in laboratory.
RH = relative humidity in laboratory.

A = RESISTANCE ; Unit: OHMS
B = ; Unit:

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